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Motor Industry's New Safety Plans

Carlton, Hoffman Outline Plans to Include Federal Agency and Uniform Laws

Believing that safety on the highways rests more in the hands of governing and enforcement bodies than with the automotive manufacturers, two reports from the industry directed to Daniel C. Roper, Secretary of Commerce, and made public this week, have urged the creation of a Federal highway safety coordinating agency headed by a cabinet officer or having a permanent secretary from the Bureau of Public Roads.

The reports were made by two committees which Secretary Roper had appointed at the Accident Prevention Conference in Washington last December. One is the report of C. C. Carlton, president of Automotive Parts and Equipment Manufacturers, Inc. and chairman of the Devices Committee. The other is the report of the Committee on Cooperation of the Automotive Industry, headed by Paul G. Hoffman of Studebaker.

In answer to many specific questions, the reports discussed the dis-

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Tractor Trade-Ins Now Vital Problem

Industry's Leaders Favor Allowance Formula Based On Ten-year Average Life

Trade-ins during the past few years have become a vital problem in the tractor industry. The chief factor, according to leaders of the industry, is the matter of allowances and efforts are being made to handle the situation by prescribed formula.

The general tendency is for dealers to make too large allowances—often as high as one-fourth to one-third the original value—in spite of the fact that most trade-ins have been in use for ten years or more, which is considered the average life.

Although tractors seldom aggregate more than 5000 actual miles, this, according to C. D. Wiman, president of Deere & Co., is the equivalent of 195,000 at 40 miles an hour in a low-priced automobile. The calculations are based on crankshaft revolutions.

The situation is even further complicated by the fact that until recent

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This Week

We print on pages 542 and 543 mechanical specifications of American passenger cars. These specifications tables will be brought up to date each month, and will be printed regularly in the second issue of each month of AUTOMOTIVE INDUSTRIES. The next reprinting will be in the issue of May 9, for example.

In addition to material usually included in such tables we have calculated for each chassis model the gas-displacement factor, as an indicator of theoretical performance.

The displacement factor given in the specification table is based on the equation

$$f = \frac{3825\,D\,r}{W\,d}$$ cu. in. per ton-foot,

where D is the piston displacement of the engine in cu. in.; r, the reduction ratio between crankshaft and driving wheels; W the weight with normal load (shipping weight of five-passenger, four-door sedan or equivalent model plus 300 lb.) in lb. and d, the effective diameter of the driving wheels (as given by tire manufacturers), in inches. Other things being equal, the accelerating ability of the car goes up and down with the displacement factor, while the fuel economy varies inversely, going down as the displacement factor goes up.

See pages 542 and 543.

FHA Issues Rules for Loans On Machinery and Equipment

Under the recently amended Federal Housing Act, modernization loans of $2,000 or less will not be eligible for insurance in connection with the purchase and installation of equipment and machinery unless it is to be permanently affixed to real property. Effective April 1, 1936, to continue for one year, the amended act specifically limits such loans for the financing of repairs, alterations and additions upon property on which there is a complete structure at the time the loan is made, and such loans of $2,000 to $50,000 are eligible for insurance.

April Schedules Near Half-Million

Plants Strain Facilities To Meet Requirements of Unexpected Retail Demand

By HAROLD E. GRONSETH

Delivery reports for March have recorded one of the swiftest and most extensive upturns in retail business ever experienced by the automobile industry. While motor executives had looked forward with confidence to an active spring business and had planned for a substantial volume, no one in the industry had foreseen the sweep of buying that already has surged into the market.

For several companies the March volume has set an all-time record. Even the most optimistic forecasts proved conservative after the final 10 days' reports were in. Some did as much business in that period as in the first 20 days. One company accounted for 57 per cent of its entire month's volume in the last 10 days which also exceeded the first 10 by 31 per cent.

So suddenly was the industry engulfed by this heavy spring demand that

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A.S.I. Show Opens In Chicago Dec. 9

M.E.W.A. Now Expected to Cooperate with Other Parts Groups in Organizing Show

The 1936 Automotive Service Industries Show will be held on the Navy Pier, Chicago, Dec. 9 to 13 inclusive, according to the decision of the Joint Operating Committee representing the sponsoring associations at a meeting held in Chicago April 7.

Motor and Equipment Wholesalers' Association, which had announced that it would sponsor a show of its own instead of cooperating as in former years with the Motor and Equipment Manufacturers' Association and the National Standard Parts Association, now is expected to come back into the A. S. I. Show, thus removing fears of the industry that it would be faced with competing shows this year.

While details of M. E. W. A.'s participation have not yet been announced and while members of the Joint Operating Committee refused to comment officially, it is understood on good authority that differences between the

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Tire Industry to Decentralize As Escape from Akron Troubles

Decentralization apparently will be the answer of the Akron tire and rubber industry to organized labor's attempt to unionize its 40,000 workers. As an aftermath of the recent labor strife in the Goodyear, Goodrich and Firestone factories, the B. F. Goodrich Co. on April 7 made known plans for the establishment of factories outside of Ohio and for the transfer of a considerable portion of its production from Akron to these new plants and to its main subsidiary factory in California.

While it had been rumored ever since the settlement of the Goodyear strike two weeks ago that the major Akron rubber and tire companies were planning to transfer production out of Akron, the Goodrich announcement is the first public declaration of the actual execution of such plans. Plans for building a new tire and tube factory "in the West" and a mechanical goods plant "outside of Ohio" to meet customers' demands, were revealed April 7 by T. G. Graham, vice-president of Goodrich.

"Customers have let it be known," said Mr. Graham, "that we had better establish additional plants outside of Akron if we expect to enjoy our full share of their business, because they were alarmed by the disorderly events which have taken place in Akron recently and they are not willing to take any chances with their source of supply on such an important item as rubber products. . . . We are making plans in our engineering department for a plant outside of Akron, in the East, where we can build tires and tubes. We are also making plans for a mechanical goods factory outside of Akron and outside of Ohio." It is reported that the eastern plant, to which Mr. Graham referred, will be near Oaks, Pa., a suburb of Philadelphia, where the company has had a large rubber reclaiming plant for several years.

In the meantime, announcement has been made by Goodyear that 160 men have been added to its plant at Gadsden, Ala., following the purchase of new machinery for inner tube production. This brings the total payroll for the plant to 1200 and the daily capacity will be from 6000 to 8000. The General Tire and Rubber Co. has also announced the establishment of a mechanical goods and tire factory "outside of Ohio."

Both industry and labor leaders openly admit they regard the settlement of the Goodyear strike as a "shoe string" settlement, and the spread of labor strife to other Akron tire plants has given rise to the fear that shortly the city will be confronted with an industry-wide strike involving more than 40,000 workers. The gravity of the situation is increased when it is realized that Goodyear, Goodrich and Firestone, all with main plants in Akron, supply more than 75 per cent of all original equipment tires and the bulk of other rubber products used in automobiles and trucks. The other major original equipment supplier is the United States Rubber Co., whose main tire factory is in Detroit.

Goodrich has substantial tire production capacity in its California plant and also has a large Canadian factory. Goodyear has plants in California and at Gadsden, Ala., and in addition now controls the Kelly-Springfield Tire Co. at Cumberland, Md. Firestone has plants located in California and Canada.

Andre Dubonnet
French automobile designer, arrived in New York Wednesday with his new car. **(See page 538.)**

Feb. MEMA Index Shows Slump in Many Divisions

The temporary decline in February business is reflected in the monthly index figures compiled by the Motor and Equipment Manufacturers Association. While shipments in nearly all divisions dropped from the January level the grand index for February stood at the same point as in the corresponding month of 1935. The complete index appears below:

	Feb., 1936	Jan., 1936	Feb., 1935
Original equipment to vehicle manufacturers	127	156	123
Service parts to wholesalers	116	114	145
Accessories to wholesalers	160	170	102
Service equipment to wholesalers	84	85	70
Grand Index (Composite of above)	123	145	123
Car and truck production	127	160	149
General business — bank transactions	69	74	56

W.-O. Claims Deadline Postponed Until May 1

Reorganization plans for the Willys-Overland Co. may not be completed until about May 1, it was indicated in a postponement of the deadline for filing of claims. Special Master Charles W. Racine was authorized to extend the deadline from April 7 to April 20 by Judge George P. Hahn in Federal Court. It was explained this was in order to get in claims of common and preferred stockholders. General creditors' claims, tax liens, and bondholders' claims are mostly on file, it was explained.

Empire Securities, Inc., originally contracted with general creditors and bondholders to bring in a reorganization plan within 30 days from Feb. 28, but it was necessary to extend the time due to the large amount of appraisal work to be done preliminary to the final draft of the reorganization plan.

The company is now operating under the 15,000-car authorization by Federal Court. First units came off the lines April 6. David R. Wilson, president, hopes the present production will continue without interruption and that the reorganization may be effective before the conclusion of the operations under the court order. The company has about 1800 workers on the payrolls now.

APEM Member Payrolls Up 23% in Jan. Over Year Ago

Figures just compiled by Automotive Parts and Equipment Manufacturers, Inc., on 333 member companies for the month of January, 1936, show that the industry gained 17.2 per cent in number of employees and 17.9 per cent in man-hours worked during that period over the similar period and for the identical companies in 1935. Payrolls were 23.1 per cent greater in January of 1936.

Earnings Statements of Automotive Companies

	1935	1934
Bower Roller Bearing Co.	$838,502	$615,771
Continental-Diamond Fibre Co.	167,677	99,710*
Continental Motors Corp.	48,003*	1,977,619*
Crown Central Petroleum Co.	383,817	107,623
Spicer Mfg. Corp.	628,713	669,800
Thermoid Co.	112,119	113,892*

* Net Loss.

The average number of hours worked per week per employee during this period was 36.8. The average hourly rate increased from 60.3c per hour in January of 1935 to 62.9c per hour in 1936. The average weekly earning per employee for the period was $23.18, an increase of $1.12 per employee per week over January of 1935.

Huge Rail-Truck Tie-up Announced

Three Western Railroads in $6,000,000 Trucking Venture, Branded Monopoly by A.T.A.

Three of the western trunk railroads which have been recently acquiring vast holdings of trucking companies, tipped their hands in Chicago on Thursday. They let it be known that a system of coordinated rail-truck service is to be inaugurated over their roads. The move, it is said, is in the form of an agreement that amounts to virtually a merger of interests. The roads which are involved are the Chicago, Burlington and Quincy, the Chicago and North Western and the Union Pacific. It is estimated that when the planned venture is completed it will represent a $6,000,000 outlay.

At the Burlington offices it was explained that railroads are making this move to "fight fire with fire." It was explained that several trucking concerns have taken steps toward similarly coordinated service, and that the Keeshin Transcontinental Freight Lines, Inc., has actually gone ahead with putting such service into effect. Keeshin recently entered into a contract with the Chicago Great Western for this service. The announcement was made that when the Keeshin company had entered into a contract with the Great Western road, considerable pressure was brought to bear to induce

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GM March Sales Highest in History; 89% Above Feb.; Dealer Stocks Low

General Motors March sales to consumers in the United States constituted an all-time high for any month in the corporation's history. The 181,782 units delivered were 89 per cent more than in the previous month, 43 per cent above March, 1935, and nearly 5 per cent above April, 1929, the next highest month when 173,201 units were sold.

Sales to U. S. dealers, though substantially larger than in the preceding month, rose less rapidly than consumer sales. Stocks were depleted by more than 19,000 units, compared with a February increase of 20,000 units.

Sales to foreign dealers, including Canada, totaling 34,303 units, were 22 per cent above the February figure, but 9 per cent below March, 1935.

Gains in sales to both dealers and consumers for the first quarter were revealed. World sales for the period, totaling 500,167 units, represented an increase of 29 per cent over the 1935 total in the same period of 388,716 units.

The accompanying table shows General Motors sales for March compared with February and March a year ago, and also the comparative totals for the first quarter.

	March, 1936	Feb., 1936	March, 1935	Three Months 1936	Three Months 1935
Sales to world dealers.....	196,721	144,874	169,302	500,167	388,716
Sales to U. S. dealers.....	162,418	116,762	132,622	410,314	301,256
Sales to U. S. consumers.....	181,782	96,134	126,691	379,950	258,093
Change in U. S. dealer stocks.	— 19,364	+ 20,628	+ 5,931	+ 30,364	+ 43,163
Sales to foreign dealers.....	34,303	28,112	37,680	89,853	87,460

A. N. Benson Succeeds Frost As Operating Head of NADA

A. N. Benson, who recently joined the N.A.D.A. headquarters staff, has been named assistant to the president and succeeds the late Jack Frost as operating head of the association. Mr. Benson was formerly general manager of the Minnesota Automobile Dealers Association.

6-Passenger Convertible Coupe Announced by Ford

A new Ford V-8 deluxe convertible body type—a club cabriolet with seats for six, is announced by the Ford Motor Co. Its convertible top is deeper than the deluxe cabriolet so as to house a second three-passenger seat fitted in the forward rear deck. The seat back is divided, either half tilting forward to allow access to the club seat in the rear. The luggage compartment is reached through the rear deck.

Motor Products Strikers Vote To Leave MESA for AFL Union

Some 200 strikers at the Motor Products Corp. plant voted last week to secede from the Mechanics Educational Society, which they had joined early this year, and to join the United Automobile Workers' Union, affiliated with the American Federation of Labor. As result of disputes arising out of the strike many of the workers have shifted their allegiance from organization to organization in the course of the past year. Starting as members of the original Federal Union they swung over to the Automotive Industrial Workers Association a year ago, then switched to the M.E.S.A. and are now back to the Federation's U.A.W.

Heavy Reo Stock Sales Arouse Interest in April 21 Meeting

The coming annual meeting of the Reo Motor Car Co., to be held at the factory in Lansing on April 21, is awaited with considerable interest.

During the past year large blocks of Reo stock have changed hands. It is believed that most of the shares formerly owned in Lansing have been purchased by outside interests. Various rumors concerning Reo's future are circulating in Lansing. It is said that only a small percentage of stock is now held by R. E. Olds, chairman of the board, and by other officials of the company, although it is impossible to obtain confirmation or denial of the reports.

Sovfoto photo.

The NATI plant of the U. S. S. R. has begun production of a new model 12-passenger bus for use on suburban lines. The bus is mounted on a truck chassis

Eaton Says Lower HP. Tax Helps British Car Factories

The Eaton Manufacturing Co., through its new English subsidiary, British Aero Components, Ltd., has entered production of sodium cooled valves and other precision motor parts at its recently established plant in Coventry, England, J. O. Eaton, chairman of the board of Eaton Manufacturing, announced today. The plant will serve the British aircraft and automotive industries and will be in full swing within a few weeks. Installation of precision equipment required for manufacture of valves and hydraulic tappets under license from the Wilcox-Rich division of Eaton is now almost complete.

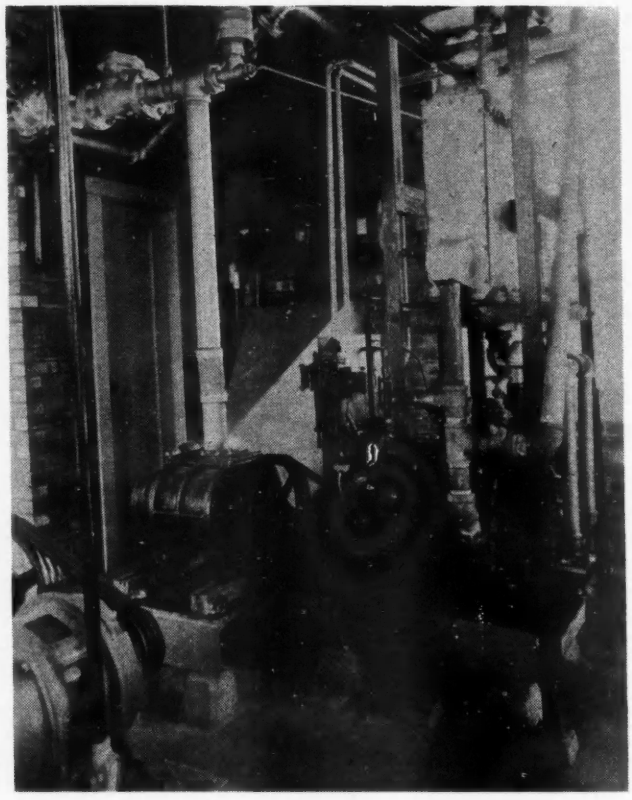
"By investing in a plant in England," Mr. Eaton said, "the company has placed itself in a position to serve directly the British automotive industries which are swinging toward more efficient and more powerful motor vehicles. Entry into this overseas market is particularly opportune in the face of current demands for reduction in motor vehicle taxes and fuel taxes. There is every reason to expect parliament to grant these concessions, some of which may run as high as 25 per cent of the present taxes.

"Reduction in the horsepower tax late in 1934 from 20 shillings (one pound) to 15 shillings is accredited with having added 90.000 passenger cars to production in the 1935 season. This reached 311,544 as against 182,347 in 1929. Further, where about 90,000 car owners licensed their cars only for the summer months in 1934. all but 25.000 took out year-round licenses in 1935.

"These steps have already brought an increased demand for higher horsepower motor cars, more on the American type, and are opening up new export opportunities to British motor makers whose development and volume were heretofore held back by prohibitive tax rates."

The British government's hundred-million-pound "Five-Year" program of road building, first coordinated highway planning in some years, will give an added impetus to the British motor industries. It is estimated that more than 450,000 passenger and commercial vehicles will be produced in England in 1936.

Early production at Eaton's British plant has been largely for the Bristol Aeroplane Co., Ltd., and Rolls-Royce, Ltd., according to Eric Carpenter, manager of the plant in which the British Piston Ring Co., Ltd., has a large interest. William A. Oubridge, president of the latter company, is general supervisor of British Aero Components, Ltd.



Perpetual Motion?

Sewer gas runs this powerplant at Greencastle, Ind. The Ford V-8 engine, with blower attached, supplies oxygen to the aeration basin at the sewer disposal station, while water pumped from its own cooling system keeps the septic tanks at proper temperature. Methane gas, given off by the bacterial action of the sludge, is piped back to the intake manifold where it is mixed with air and becomes the engine's only fuel. The plant has been in operation 24 hours a day, seven days a week since March 1, 1935, with only minor repairs.

British January Production Up; Imports and Exports Show Gains

British motor vehicle production in January amounted to 30,437 passenger cars and 9831 trucks, representing a total increase over the corresponding month last year of 2135 units.

Total automotive imports for the first two months made corresponding gains. Imports for the period, valued at £734,787, represented a gain of 13 per cent over the first two months of 1935, according to *The Motor Trader*. Exports amounted to £2,467,325, an increase of seven per cent.

The table below gives comparative import and export figures by various divisions:

	February, 1936		Two Months, 1936		Two Months, 1935	
Imports	Units	Value in £	Units	Value in £	Units	Value in £
Passenger car	919	150,925	2,032	338,159	2,304	348,343
Commercial vehicles	38	5,577	58	9,620	41	8,945
Chassis	220	25,320	533	61,033	715	81,738
Parts	....	204,735	....	325,975	....	195,678
Total	....	386,557	....	734,787	....	634,704
Exports						
Passenger cars (new)	4,167	485,615	7,620	927,577	7,753	973,452
Passenger cars (used)	341	37,678	699	78,854	458	55,611
Commercial vehicles	238	67,954	430	121,542	361	89,023
Chassis (commercial)	1,129	157,090	2,274	343,166	2,067	298,829
Chassis (other)	1,158	91,795	2,245	175,661	1,310	124,715
Engines	795	17,437	1,544	32,772	970	27,745
Spark Plugs	113,393	6,885	210,545	13,041	265,725	15,297
Parts	....	189,062	....	371,899	....	334,159
Tires & tubes	....	219,745	....	402,813	....	402,042
Total	....	1,273,261	....	2,467,325	....	2,320,873

Mexico's Motor Vehicles Passed 100,000 in 1934

Mexico averages two motor vehicles for every kilometer of highways in service, according to a report of the Ministry of Communications and Public Works. In 1934, the most recent year covered by the ministry's figures, 103,711 registered motor vehicles were in service, most of them operating in the Federal District, which includes Mexico City, Lower California Territory, and Coahuila, Chihuahua, Jalisco, Nuevo Leon, Sonora and Tamaulipas states. During that year, 1013 kilometers of asphalt roads, 10,099 kilometers of topped highways and 31,572 kilometers of old roads that had been improved were in service.

During 1934, 71,355 tourists type automobiles, 7033 passenger buses and 25,323 freight trucks, exclusive of automobiles in Puebla and Vera Cruz

states, were operating in Mexico. In 1933, 96,977 motor vehicles were using 42,684 kilometers of highways. Regions that had the most motor vehicles in 1934 were: the Federal District, 31,844; Lower California, 4934; Jalisco, 4568; Nuevo Leon, 3719; Chihuahua, 3192; Tamaulipas, 2982; Coahuila, 2973, and Sonora, 2872.

A.S.I. Show Opens In Chicago Dec. 9

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associations have been ironed out and that M. E. W. A. will soon add its representatives to the committee.

A precedent will be established this year by opening the show on Wednesday. The first two days, Wednesday and Thursday, will be closed to all but jobber members of the sponsoring associations. Friday and Saturday will be opened to invited guest jobbers approved by the Credentials Committee and the last day, Sunday, will be open to the repair and maintenance trade. This arrangement will permit the sponsoring associations to begin their convention sessions on Sunday, Dec. 6.

L. G. Matthews, Sealed Power Corp., Muskegon, Mich., was named chairman of the Joint Operating Committee, and J. M. Spangler, National Carbon Co., New York, vice-chairman.

Goodyear Appeals from FTC Order in Sears, Roebuck Case

The Goodyear Tire & Rubber Co. on Tuesday filed in the United States Circuit Court of Appeals at Cincinnati a petition for review of the Federal Trade Commission's "cease and desist" order of March 5 requiring the company to "cease and desist" from selling tires to Sears, Roebuck & Co. at alleged discriminatory prices.

The Goodyear petition set forth 18 alleged fundamental errors of the commission's report and 80 evidentiary and contributing errors which are said to have resulted in the fundamental errors on which the order is based. The company asked review of every main and auxiliary issue of the defense, including the entire subject of quantity discounts within the quantity proviso of the Clayton Anti-Trust Act, under which the Goodyear-Sears' contract was attacked.

Chief among the contentions brought out in the petition is that the two types of business, special brand and wholesale, are not comparable and that whatever the effect of the Goodyear-Sears' relationship may have been, it did not manifest itself in interstate commerce, which is the only field of commerce with which the Clayton Act is concerned.

The case has taken on added interest by reason of the recent decision of the United States Supreme Court in the Sugar Institute case. In that decision the Supreme Court upheld as sound economics the practice of granting quantity discounts.

Federal Reserve Asked to Check Long Term Retail Loans by Banks

The National Association of Sales Finance Companies has extended its efforts to keep banks out of the instalment finance business to the Federal Reserve Board. In a letter to the Board, the association's executive vice-president, John R. Walker, urges that in drawing rules and regulations for the administration of Section 10b of the amended Federal Reserve Act, a policy be formulated that will not encourage banks to load themselves up with long term obligations.

This section of the Act authorizes the Federal Reserve to make advances on notes of member banks up to four months' maturities which are secured to the satisfaction of the Board. Mr. Walker recommends that the Board rule that such collateral security must be of a character "that the sums payable during the period of the advance by the makers of the obligations constituting the collateral would suffice to pay the advance at its maturity."

After pointing out that when bank credit is made available to the public through a finance company, a cushion of 40 per cent is ordinarily provided by the company's cash balance and by the payment on the collateral time sales contracts, Mr. Walker says: "When, however, the commercial bank reaches out over the head of the secondary financial institution and extends long-term credit direct to the public in the form of: a 12 months personal loan; a 24 months instalment purchase loan; or a 5 or 10 year real estate mortgage; it short-circuits the protective mechanism provided by the capital of the secondary financial institution, and provides against the 'calls on currency' which it has created merely the legal reserves of 7 per cent or 10 per cent; or, on that portion of its deposits classed as savings accounts, 3 per cent."

Tractor Trade-Ins Now Vital Problem

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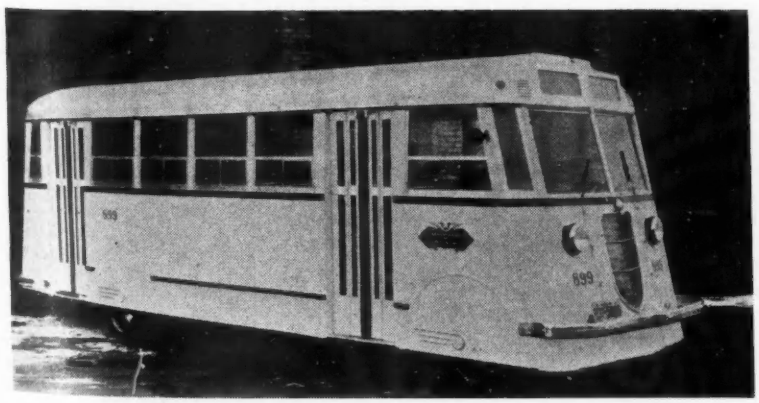
years few style or even performance changes have been effected to induce sales, and also by the fact that replacing rubber equipment, where it was furnished on the old models, would cost at least $225.

Much of the investigation of this phase of tractor selling has been conducted by Harry G. Davis, research and statistical director for the Farm Equipment Institute, and under his supervision a tentative formula has been prepared based on a ten-year tractor life and the cost of reconditioning.

Ainsworth Manufacturing Co. has declared a special dividend of 50 cents a share on common stock, payable April 10 to stockholders of record March 31. A dividend of $1 was paid on March 2 and Dec. 28, 1935.



(Left) Light-weight aluminum alloys keep the weight of this 22-passenger bus under 6500 lb. Designed and built by the Detroit Street Railway Commission, it is mounted on a standard Ford V-8 bus chassis. (Right) Inside, the driver sits beside the insulated engine, while air ducts in the roof furnish ventilation and novel safety devices on the doors assure protection

Striking Gains by Chevrolet Shown In First Two Months' Registrations

New Passenger Car Registrations

	February 1936	January 1936	February 1935	Two Months 1936	Two Months 1935	Per Cent Change, 2 Mos. 1936 over 1935	Numerical Change, 2 Mos. 1936 over 1935	Per Cent of Total Two Months 1936	Per Cent of Total Two Months 1935
Chevrolet	53,327	62,999	29,536	116,326	56,085	+107.5	60,241	29.64	18.25
Ford	43,724	50,744	64,957	94,468	111,263	— 15.2	—16,795	24.07	36.22
Plymouth	23,577	29,922	26,886	53,499	51,759	+ 3.5	1,740	13.63	16.85
Dodge	11,105	15,240	11,352	26,345	20,330	+ 29.7	6,015	6.71	6.62
Oldsmobile	9,363	11,552	9,220	20,915	13,673	+ 53.0	7,242	5.33	4.45
Pontiac	7,848	9,377	8,737	17,225	14,601	+ 18.0	2,624	4.39	4.75
Buick	6,651	9,169	3,651	15,820	7,891	+101.0	7,929	4.03	2.57
Terraplane	3,727	4,661	3,269	8,388	6,279	+ 33.7	2,109	2.14	2.04
Studebaker	3,199	3,943	2,123	7,142	4,800	+ 48.8	2,342	1.82	1.56
Chrysler	2,785	3,666	2,646	6,451	4,570	+ 41.1	1,881	1.64	1.49
Packard	2,424	3,030	348	5,454	779	+600.0	4,675	1.39	.25
De Soto	1,763	2,325	1,458	4,088	2,719	+ 51.0	1,369	1.04	.88
Hudson	1,236	1,752	1,264	2,988	2,581	+ 16.0	407	.76	.84
Nash	970	1,467	803	2,437	1,636	+ 49.0	801	.62	.53
La Fayette	869	1,128	810	1,997	1,661	+ 20.1	336	.51	.54
Graham	798	893	900	1,690	1,496	+ 13.1	194	.43	.49
Lincoln	699	801	113	1,500	228	+558.0	1,272	.38	.07
Cadillac	637	856	316	1,493	613	+144.0	880	.38	.20
Willys	781	707	637	1,488	904	+ 64.8	584	.38	.29
La Salle	568	714	404	1,282	773	+ 66.0	509	.33	.25
Hupmobile	208	328	440	536	992	— 46.0	—456	.14	.32
Reo	157	241	194	398	422	— 5.7	— 24	.10	.14
Auburn	175	201	423	376	909	— 58.6	—533	.10	.30
Pierce-Arrow	48	56	39	104	89	+ 17.0	15	.03	.03
Cord	7	.....	.....	7	.....	.....	7	.....	.....
Miscellaneous	22	10	89	33	197	— 83.4	—164	.01	.07
Total	176,668	215,782	170,615	392,450	307,250	+ 27.8	85,200	100.00	100.00
Chrysler Corp.	39,230	51,153	42,342	90,383	79,378	+ 14.0	11,005	23.03	25.83
Ford and Lincoln	44,423	51,545	65,070	95,968	111,491	— 14.0	—15,523	24.45	36.29
General Motors	78,394	94,667	51,864	173,061	93,636	+ 85.0	79,423	44.10	30.48
All Others	14,621	18,417	11,339	33,038	22,745	+ 45.2	10,293	8.42	7.40

New Truck Registrations

	February 1936	January 1936	February 1935	Two Months 1936	Two Months 1935	Per Cent Change, 2 Mos. 1936 over 1935	Numerical Change, 2 Mos. 1936 over 1935	Per Cent of Total Two Months 1936	Per Cent of Total Two Months 1935
Chevrolet	14,978	15,124	11,701	30,102	21,568	+ 39.7	8,534	35.81	31.01
Ford	12,226	14,606	14,330	26,832	27,590	— 2.9	—758	31.92	39.67
Dodge	5,556	6,207	3,271	11,763	8,412	+ 39.9	3,351	13.99	12.09
International	4,365	4,743	3,174	9,108	6,687	+ 36.1	2,421	10.83	9.61
G. M. C.	758	428	570	1,186	1,428	— 17.0	—242	1.41	2.05
Diamond T	510	495	499	1,005	1,049	— 4.6	— 44	1.20	1.51
White	293	409	204	702	485	+ 45.0	217	.84	.70
Reo	217	339	292	556	672	— 17.2	—116	.66	.97
Federal	170	223	113	393	265	+ 48.3	128	.47	.38
Plymouth	188	193	3	381	8	.....	373	.45	.01
Willys-Overland	142	178	69	320	78	+310.0	242	.38	.11
Studebaker	134	143	107	277	234	+ 18.4	43	.33	.34
Indiana	115	84	13	199	40	+398.0	159	.24	.06
Mack	107	90	63	197	177	+ 11.3	20	.23	.25
Brockway	88	94	54	182	140	+ 30.0	42	.22	.20
Terraplane	94	59	15	153	44	+248.0	109	.18	.06
Stewart	62	85	34	147	76	+ 93.4	71	.17	.11
Autocar	57	75	41	132	112	+ 18.0	20	.16	.16
Divco	33	53	16	86	32	+169.0	54	.10	.05
F. W. D.	37	19	31	56	45	+ 24.5	11	.07	.06
Twin-Coach	38	1	6	39	15	+160.0	24	.05	.02
Sterling	4	8	10	12	20	— 40.0	— 8	.01	.03
Miscellaneous	129	104	181	233	379	— 38.5	—146	.28	.55
Total	40,301	43,760	34,797	84,061	69,556	+ 21.0	14,505	100.00	100.00

Canadian Ford Dealers Offer 30-Day Used Car Guarantee

Additional protection in the form of a 30-day warranty for the purchaser of a reconditioned car from a Ford dealer was announced this week by the Ford Motor Co. of Canada, Ltd. The new warranty plan is an extension of the "3-5" plan introduced last year, and is designed to reduce the element of chance, from the buyer's point of view, in the purchase of a reconditioned car.

The "3-5" plan provides that if the purchaser of a reconditioned car costing over $300 is dissatisfied, he can return it within three days and get his money back in full. If it is a reconditioned car costing $150 to $300, he can return it within five days and have the full purchase price applied in exchange for another car.

The added protection now offered is described as the "50/50 30-day plan." Having made his purchase and kept it beyond the "3-5" period, the buyer has a 30-day signed warranty which provides for the repair or replacement of any part or parts listed in the warranty certificate found to be defective within a month of the purchase date, at exactly half the standard charges. Glass and tires are not included. Reconditioned cars sold on this basis will bear a diamond label and a tag listing the inspections and reconditioning operations performed on the car.

City Auto Stamping Case Sent Back for Retrial

Decision of the common pleas court nearly a year ago in dismissing a suit brought by two stockholders against directors of the City Auto Stamping Co., charging mismanagement in connection with purchase of certain patents, was reversed by the court of appeals in Toledo. The reversal remands the case for a retrial and declares the company must be made a party to the plaintiff's action in an amended petition.

The suit filed Aug. 7, 1934, by Lowell L. Baldwin, Maumee, and Thomas Kugeman, New York, was against the directors of the company. It charged the defendants entered into a contract with the Dole Valve Co., Chicago, and Willard Morrison, inventor, to acquire certain patents on ventilation of automobile bodies for $300,000 on which $50,000 was paid. The stockholder suit sought an accounting and return of money to the company.

At the annual meeting last year stockholders by specific resolution approved the acts of the directors and steps taken to adjudicate the patent contracts.

Allis-Chalmers Tractor Plants Running at Peak

Although Allis-Chalmers tractor operations at Milwaukee, Springfield, Ill., and La Crosse, Wis., are on a 24-hr. basis, the backlog of orders for these products is growing steadily, according to H. C. Merritt, manager of the tractor division. The tractor business in 1935 was the largest in Allis-Chalmers history and sales so far in 1936 range well above last year, especially as to farm units. Industrial units, however, also show a gain with even better prospects during the remainder of 1936.

Chrysler Exports Up 18% In February Over Year Ago

Overseas shipments of cars and trucks by the Chrysler Corp. in February were 17.83 per cent greater than for the corresponding period of last year, according to W. Ledyard Mitchell, vice-president in charge of exports. For January and February, export shipments of the corporation were 7.43 per cent above a year ago. One out of every three motor cars shipped overseas by member companies of the

A.M.A. during February was a Chrysler product, Mr. Mitchell said. "Our passenger car exports in that month were 15.23 per cent ahead of last year, while Chrysler-built motor trucks showed an increase of 30.89 per cent.

"These sales performances are a continuation of the renewed vigor of the overseas market for motor cars that was so strongly in evidence throughout the entire year of 1935 when our Canadian and overseas sales totaled 75,514 units and point to an even larger total and record for 1936," Mr. Mitchell said.

General Tire Increases Production of Dual 10

Production in the tire and tube departments of the General Tire & Rubber Co. of Akron was resumed April 1. The departments had been idle nearly a week for machine repairs in the mill room. General supplies no original equipment tires, but markets only through dealers. The company is increasing production of its new Dual 10 tire with multi-vane tread. Output now is running better than 4000 casings daily.

Budd Mfg. Co. Gets Order For 8-Car Santa Fe Train

The Edward G. Budd Manufacturing Co. announced this week receipt of an order for an eight-car, light-weight, stainless steel train that will cut 14 hours off the present running time between Chicago and Los Angeles.

It will be powered by a Diesel-electric unit which will vary in important features from conventional types.

Bachman Reports on Autocar Tests With Diesel Engines

Some information regarding the application of Diesel engines to trucks was given in a paper presented at the April meeting of the S.A.E. Metropolitan Section by B. B. Bachman, vice-president and chief engineer of Autocar Co. To determine the truck-design factors which would be affected by the use of Diesel engines and to learn something about the behavior of these engines from the standpoints of power, fuel consumption, lubrication and life, the Autocar Co., with the cooperation of several operating concerns interested in gaining experience with Diesel equipment, built a number of tractors for use with semi-trailers for 40,000 lb. G.V.W.

Two Diesels of different make were fitted in place of the regular Autocar gasoline engine. These engines weighed 2150 and 1950 lb., respectively, as compared with 1300 lb. for the gasoline engine. Also, in accordance with recommendations of the battery makers, starting batteries of 348 lb. weight were used, instead of the regular battery of 134 lb. weight. It also seemed desirable to use a larger transmission, and this added 279 lb. These items account for 1293 lb. but actually the first Diesel job weighed 11,835 lb. or 1777 lb. more than the standard job.

The tractor fitted with the lighter of the two Diesel engines was equipped with a lighter transmission and a lighter rear axle, and as much weight as possible was saved by reducing to a minimum such items as fenders, running boards, skirtings, radiator guards and bumper. Its weight was 10,799 lb. or 741 lb. more than that of the standard job.

The first unit has run 62,000 miles in eight months. Over the first 45,000 miles the engine performance was quite satisfactory. Since then some difficulties have arisen which indicate that the proper preventive maintenance methods were not applied. The second unit in 3½ months ran 38,000 miles and has been quite satisfactory during that period.

Making the purchase price of the gasoline unit 100 per cent, that of the first Diesel unit was 125.5 and that of the second Diesel unit 119 per cent. Also, placing the original fuel mileage of the gasoline truck at 100, that of each of the two Diesels up to November, 1935, was 196 per cent, while the fuel cost of the Diesels was 38.8 per cent that of the gasoline tractor (the operators paying the fuel tax on the Diesel fuel). Owing to the greater weight of the engines, the pay-load capacities of the Diesel trucks were less, 92.5 and 96.5 per cent that of the gasoline tractor.

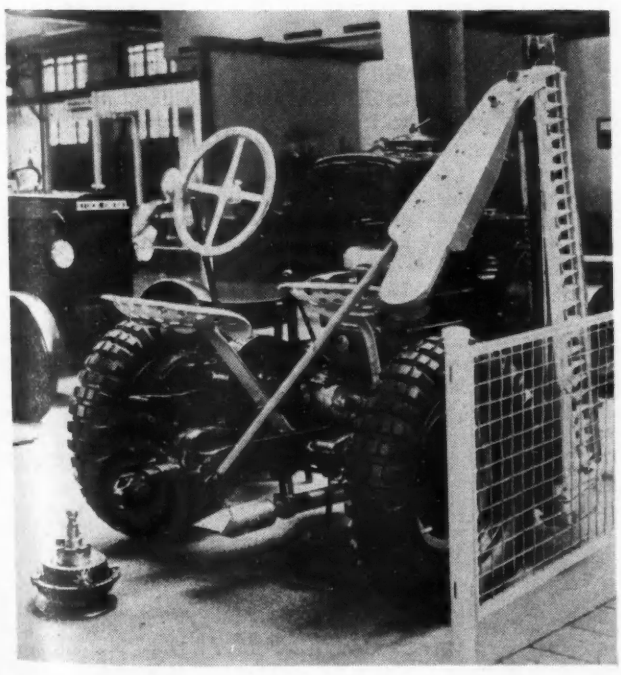
Among the conclusions which Mr. Bachman drew from the experience gained up to date were the following:

While current maintenance does not seem to be greater, there is evidence that it may be necessary to do tune-up work on rings, pistons, etc., at more frequent intervals and earlier in the operating life, which will affect maintenance costs unfavorably.

Fuel consumption can be expected to be approximately 50 per cent less than with a gasoline engine. The total saving in cost will depend on many other items, which renders it impossible to make an intelligent general statement.

Oil consumption may be about the same as in gasoline engines, but the difficulty of keeping the oil clean will call for more frequent changes of oil and of filter elements.

For best results the driving practice should be changed somewhat and the engine kept running within a comparatively narrow speed range.



European photo

Pneumatic tires for agricultural tractors are becoming popular in Germany as well as the United States. This machine was exhibited recently at the Berlin agricultural machinery show

SAE Met. Section to Honor Rickenbacker With Dinner

The Metropolitan Section of the S.A.E. will tender on May 1, to Capt. Eddie Rickenbacker, a testimonial dinner-dance at the Waldorf-Astoria Hotel in New York. The dinner is to honor Captain Rickenbacker's "patriotic and business efforts in carrying forward the science of aviation."

Parker Wolverine Co. has notified preferred stockholders that their preferred stock will be retired Sept. 1, 1936.

Ford Motor Co., Ltd., for the year ended Dec. 31, 1935, shows a net profit of £597,153 against £483,663 in 1934.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for AUTOMOTIVE INDUSTRIES

Business in the flood areas has been recovering rapidly lately. Retail sales throughout the country, stimulated by the Easter demand, increased by about 25 per cent. Most wholesale lines felt the effects of the broadened retail demand. Steel operations were at 62 per cent of capacity, which is the highest level in six years. Most commodity markets displayed an upward trend, and the consumption of cotton and silk continued at a substantial rate.

Carloadings Higher

Railway freight loadings during the week ended March 28 totaled 600,487 cars, which marks an increase of 33,679 cars above those during the preceding week, a decline of 16,033 cars below those a year ago, and a decline of 9703 cars below those two years ago.

Food Prices Decline

Retail food costs during the two weeks ended March 10 declined 2.2 per cent, according to the Bureau of Labor Statistics. Every commodity group, with two exceptions, was lower. The current index is 79.5, based on the 1923-25 average as 100, as against 81.3 a fortnight earlier and 79.6 a year earlier.

Electric Output Rising

Production of electricity by the electric light and power industry in the United States during the week ended March 28 was 9 per cent above that in the corresponding period last year.

Lumber Output Steady

Production of lumber during the week ended March 21 was about 61 per cent of the 1929 weekly average. The level of output was the highest since last November, but shipments and new business were 4 and 12 per cent, respectively, below the figures for the preceding week.

Farm Prices Sharply Lower

The farm price index compiled by the Bureau of Agricultural Economics on March 15 stood at 104, as against 109 a month earlier and 108 a year earlier. Larger than seasonal declines were reported in the prices of dairy products, veal calves, tobacco, and truck crops. The index of prices paid by farmers stood at 122, as compared with 121 a month earlier.

Fisher's Index

Professor Fisher's index of wholesale commodity prices during the week ended April 4 stood at 82.5, as against 82.6 the week before and 82.5 two weeks before.

Federal Reserve Statement

The consolidated statement of the Federal Reserve banks for the week ended April 1 showed an increase of $1,000,000 in holdings of discounted bills. Holdings of bills bought in the open market and of government securities remained unchanged. Money in circulation increased $47,000,000, and the monetary gold stock increased $8,000,000.

April Schedules Near Half Million

(Continued from page 519)

most of the factories were caught unprepared. Fortunately dealers were uniformly well supplied at the beginning of March and had substantial stocks to draw upon, but contrary to the usual experience, their stocks went down in March when they should have been going up to meet the demands of the seasonal peak, considered to be still a few weeks off. It is an uncommon thing for companies at this time of the year to sell more cars in the domestic markets than they produced for both domestic and foreign consumption. Yet that is what several did. The start of the spring selling season is not the time for liquidation of dealer stocks, but that is what generally took place, which indicates how unexpected was the volume of sales that developed.

Not a few manufacturers now regret their conservatism in February when they were influenced by the weather-induced sales lull to curtail materially their production. The penalty for their over cautious policy then is the current straining of facilities to meet the requirements of the market. Schedules have been boosted many times since the original programs for the month were laid out. One supplier reported that his company received three upward revisions in releases from a leading car manufacturer in a single day. Makers of some of the more popular cars are taxing their production facilities this month and the April schedules indicate that the industry's output will approach the 500,000 unit mark, comparing with a revised estimate for March of over 430,000 vehicles.

Studebaker

Studebaker sales for the first quarter totaled 21,229 units, an increase of 50 per cent over the corresponding period last year, and the largest for any quarter since 1929 . . . March sales amounted to 9007 units, larger than any month since September, 1929.

Buick

Domestic retail deliveries of Buick automobiles in March totaled 15,057 units, a gain of 128 per cent over February and 130 per cent over March, 1935 . . . The final 10-day period accounted for 7188 cars, the largest corresponding period since 1927 . . . April production has again been stepped up to bring the projected output to 18,602 units.

Nash

March orders at the Nash factory totaled 9864 cars, representing the company's highest March volume since 1930.

Chevrolet

Chevrolet sales for March totaled 126,119 units establishing a new high for any month in company history . . . The previous high had been 122,437 units in May, 1928 . . . Likewise a new record was set for first quarter sales with a total of 272,149, an increase of 97,839 units over the same period last year and 23,274 units higher than the previous record in 1929 . . . Used car sales by Chevrolet dealers in March amounted to 165,170 cars.

Cadillac-La Salle

March sales of Cadillac-La Salle cars were 67 per cent above February and 121 per cent above March, 1936 . . . Dealers did 31 per cent more business in the last 10-day period than in the first two such periods combined . . . The company reports five times as many orders for the custom built Cadillac-Fleetwood models as at this time last year.

Oldsmobile

March sales of Oldsmobile cars were the greatest in company history, while April schedules are the highest ever set . . . More than twice as many cars were sold in March as in February, while retail deliveries were 19 per cent above March last year and 11.5 per cent above the previous record month . . . Since the introduction of the 1936 models, 107,733 units have been sold.

40 Years Ago

with the ancestors of AUTOMOTIVE INDUSTRIES

To the Capitalist

Capital finds no more inviting field at the present time than the nascent motor business of America. Never before in the country's history did demand so far exceed supply. . . . Thousands of people in this broad land are besieging inventors for the coveted improvement, yet capital seems slow to come to the inventor's assistance and bridge the gulf between demand and supply.

Again, but with greater emphasis, will the history of the bicycle repeat itself. Enormous manufacturing plants will spring up. Fortunes will be made. A giant industry will be the outcome, and those who wisely venture first will mould its destinies. . . . So generously does civilization treat those who have the foresight and courage to supply her immediate needs. — From *The Horseless Age*, April, 1896.

Air transportation utilized 55,398,501 gal. of ethyl, or "blue aviation," gasoline last year, according to a report made public by the Ethyl Gasoline Corp. This figure represents about three-fourths of all aviation gasoline used in the United States, and an increase of 30.7 per cent over the amount of ethyl consumed in 1934. The total aviation gallonage exceeded 70,000,000 gal. in 1935.

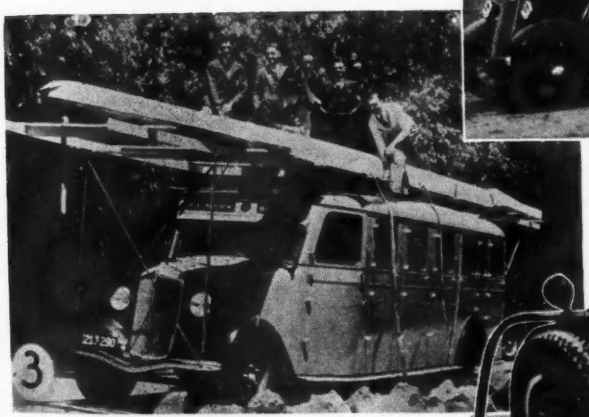
Directors of the Eaton Mfg. Co. have voted an additional 50 cent dividend on capital stock to place the issue on a regular $2 a year basis. First dividend on the new rate will be paid May 15 to stockholders of record May 1.

Vauxhall Motors, Ltd. (England), controlled by the General Motors Corp., has announced net profit for 1935 amounting to £1,535,276 compared with £1,371,481 in 1934.

The WORLD on WHEELS

1. New York's new Thirty-fourth Street vehicle tunnel under the Hudson nears completion. Work begins soon on the ceiling which will be composed of 800,000 cream-colored glass units set in steel frames.

2. In Barcelona, Spain, the Columbia Films manager enlisted the cooperation of the Ford dealer to advertise Grace Moore's picture, "Quiere Me Siempre" (Love Me Always).



3. This Australian rowing crew has solved the problem of transporting themselves in comfort and their fragile shell in safety by building a special frame mounted on top of a Reo bus.

4. Peaceful Sweden decides to form a special regiment of tanks. The type chosen is a combined crawler-wheel tank permitting the change from tread to tires in 20 seconds.

5. Great Lakes shipping came out of hibernation last week when the "Coralia" left Detroit for Cleveland with a load of 400 automobiles.

International and Underwood and Underwood photos.

Automotive Industries

March Upturn Raised A.M.A. Member Output 47% Over '35

A 47 per cent increase in motor vehicle production by members of the Automobile Manufacturers Association for March was revealed in the regular monthly production report released today by the association.

The March output for the group was estimated at 323,160 units which was not only an increase of 47 per cent over the previous month but was 15 per cent higher than March of last year.

On the basis of this estimate, the first quarter output was placed at 820,186 units, an increase of 16 per cent over the corresponding period of 1935. The first quarter's output has been exceeded only twice in the history of the industry, in 1928 and 1929.

The report which is based upon factory shipments covers the operations of all but one of the major producers in the industry. It is summarized below:

March, 1936—323,160 units
February, 1936—220,581 units
March, 1935—280,758 units
First quarter, 1936—820,186 units
First quarter, 1935—704,935 units

India Tire Reorganization Plans Filed in U. S. Court

The India Tire & Rubber Co. of Akron has filed a plan of financial reorganization in the United States Circuit Court at Cleveland. Judge Samuel H. West granted the company permission to continue its present payroll of $8,500 a month and operating expenses of $11,400 a month. The company proposes to pay reorganization costs, estimated at $6,000, within 30 days from acceptance of the plan. Security creditors would be allowed to retain present collateral or exchange for Class A preferred stock. Class B preferred and common stockholders would retain their holdings. Twenty-five per cent of $132,386 owed the Federal Government in excise taxes would be paid within 30 days.

Geschelin to Tell Oil Men About Diesel Developments

Joseph Geschelin, Detroit Technical Editor, Chilton publications, will address the National Petroleum Association at its annual meeting in Cleveland on April 16. The paper is an economic discussion of automotive Diesel developments, supported by statistics and current reports from the manufacturing and operating field.

A comprehensive abstract of the paper will appear in AUTOMOTIVE INDUSTRIES next week.

Borg-Warner Officials Deny Having "Mono-Drive" License

Borg-Warner Corp. officials in Chicago this week denied that the company has been licensed to manufacture the "Mono-Drive" automatic transmission.

"We have been negotiating for about two years for a license to manufacture this product," said Edward G. Gritzbaugh, the company's patent counsel, "but no deal has been closed. Neither can I say how soon it will be closed. The company was offered a license to manufacture this product about two years ago but for various reasons it was not taken up. We have been considering the matter of automatic-shift transmissions for a number of years, but so far our activities have been confined solely to experimental work."

Swedish Car Sales Up 40%; 73% Are of American Make

Passenger car sales in Sweden totaled 13,915 units last year, compared with 9945 in 1934, according to the Department of Commerce, while truck sales, including bus chassis, amounted to 6610 units against 5575 the preceding year.

Of the total Swedish market, 10,175 passenger cars and 4330 trucks were supplied by American manufacturers. The domestic company, Volvo of Gothenburg, was the leading European supplier, with sales in the local market last year amounting to 2395 units.

Closed models in the low and medium priced group constitute the bulk of the Swedish market, and it is reported that local manufacturers have produced no radical innovations in design or construction, but have followed closely the American industry.

Light Cabin Planes Lead Air Output Gain in 1935

Aircraft production in the United States totaled 1691 units in 1935, slightly more than the 1615 manufactured in the preceding year, but still far below the 1929 level of 6193. Domestic civil aircraft, according to the Bureau of Air Commerce, accounted for 1079 of the planes made last year, while 317 were delivered for military use and 295 for export.

The most notable increase was in the line of small civilian aircraft, particularly the one and two-place cabin monoplanes which totaled 460 units, compared with 120 in 1934. In the seaplane class, including flying boats and amphibians, only 17 were produced ranging from two to fifty-two-place craft. A total of 91 multi-engined units was produced.

Out of the 137 companies or individuals that were producing planes in 1935, only six had an output of 50 or more, while 103 made only one plane.

Tire Industry's Sales $554,162,000 in 1935

That the rubber and tire industry made significant recovery strides during 1935 is shown by the official tabulation of the industry's activities, just compiled by the Rubber Manufacturers Association. The total sales value of manufactured products of the industry in 1935 was $554,162,000 compared with $520,479,000 in 1934 and $480,478,000 in 1933. For the tire and tube, and tire accessory branch of the industry the total sales value last year was $339,563,000 against $317,996,000 in 1934 and $301,271,000 in 1933. In this branch manufactured sales' value reached its peak in the second quarter, when it was $100,537,000 compared with $84,662,000 in the first quarter, $80,569,000 in the third quarter and $73,794,000 in the fourth quarter.

The industry consumed 520,845 tons of crude rubber last year, an all time high. The figure in 1934 was 420,591 tons and in 1933 was 362,806 tons. At the end of 1935 the industry had 251,-

(Turn to page 548, please)

"Modern Melting" is the title of a handbook and catalog for those concerned with foundry and high temperature process melting, put out by the Detroit Electric Furnace Co., Detroit.

Struthers Dunn, Inc., Philadelphia, Pa., has issued a 28-page catalog covering **relays, timing devices, thermostats, resistors, etc.**

"Properties of **Toncan Iron**" is the title of a new folder of the Republic Steel Corp., Massillon, Ohio.

Roloid helical **rotor pumps** are described in a leaflet issued by David Brown & Sons (Hudd), Ltd., Huddersfield, England.

A complete line of attachments for **electric screw driving** and **nut setting** is described in catalog No. 60 of the Independent Pneumatic Tool Co., Chicago.

American **Lubricating Greases**, by James I. Clower, Assistant Professor of Machine Design. Bulletin of Virginia Polytechnic Institute, Blacksburg, Va.

This bulletin on lubricating greases deals with the subject with a view to aiding users and buyers in making a more rational selection of greases for their particular needs. Information concerning the composition, manufacture, uses and testing of grease is given in concise, non-technical language and numerous illustrations accompany the text. We understand that free copies of the bulletin may be had from the author or from the Director of Publications of Virginia Polytechnic Institute, Blacksburg, Va. A special feature of the publication is a large folding chart giving the classification, composition and uses of numerous types of commercial grease.

METALS..

Steel Rate Gains in Rush To Fill Low-Priced Orders

Rolling and finishing mills continued this week to operate at impressively high rates, so as to be able to make as large shipments of steel as possible to automotive consumers who still have heavy tonnages due them at lower prices than those now quoted. The American Iron and Steel Institute reported a further gain for the current week in employed ingot capacity, which was placed at 64.5 per cent of capacity, compared with 62 per cent in the preceding week. Flat steel producers in the Detroit and Cleveland-Lorain districts were operating at capacity and those in Youngstown and Pittsburgh reported good gains. Chicago and Buffalo district rolling mill operations were also up.

These developments, however, failed to shed light on how market conditions will shape up after the mills have discharged their obligations at lower prices. So far no representative tonnages of flat steels are reported to have been sold at second quarter prices. Producers insist that, come what may, there will be no concessions from these. Consumers, having covered a large part of their second quarter needs, will not cross the stream until they come to it.

If commitments during the first half of May come in at a rate which will permit mills to maintain operations at a relatively good pace, the quotations now named will stand a fair chance of holding. Should the tapering off in mill operations become pronounced, buyers, as they have done in the past, look for some of the sellers to become more aggressive. And that aggressiveness has in the past, more often than not, taken the form of concessions.

It is traditional in the steel market that when business is very light, there is little use in shaving prices, sellers then being in a frame of mind that sees little profit in such tactics. When demand is so extraordinarily heavy that all mills have good-sized backlogs, the strength of the market sticks so glaringly out that there would be no sense in sellers yielding their natural advantage. When, however, there is a tight fit between demand and fairly profitable mill operations, then the temptation for this or that producer to steal a march on competition by making concessions to tonnage buyers has in the past been found to be usually irresistible. At this time, buyers as well as sellers have their ears to the ground to detect at the earliest possible moment what is in the offing.

Pig Iron—Automotive foundries are calling for fair-sized tonnages of second quarter iron, first quarter contracts having been generally completed on April 1. The markets rule steady and unchanged.

Aluminum—Both primary and secondary metal interests report a fair volume of business at unchanged price levels.

Copper — Consuming demand continues quiet. Early this week very little was heard of the predicted advance to 9½ cents, which had been the outstanding topic of market discussion during the preceding week. The long range outlook, producers say, has not changed, however, and they are confident of an uptrend in prices before long. So far 9¼ cent copper is freely offered.

Tin—The market has turned dull. Spot Straits tin was quoted at the beginning of the week at 47½ cents, a shade easier than at the preceding week s close.

Lead—Slightly more active and steady.

Zinc—Output is on the uptrend. Market quotably unchanged.

Motor Industry's New Safety Plans

(Continued from page 519)

astrous effect of limiting speeds by mechanical means, while modern bumpers were defended on the ground that they are an ideal compromise between sheer strength and flexibility. The elimination of glare was put up to the individual motorist in the proper use of his light controls, and the use of inferior replacement parts, sold on price alone, was flayed on the grounds of the increased accident hazard.

The six-point safety program of the Motor Vehicle Administrators was endorsed in full by the reporting committees. Briefly, this includes establishment of state coordinating bodies, the elimination of incompetent drivers, the enactment of uniform driving laws, public safety education, withdrawal of the fear appeal in safety campaigns, and the formation of a complete safety plan by the end of the current year.

In addition to the support of this plan and the formation of the Federal agency, conclusions and recommendations of the reports endorsed the educational programs now being carried on by the industry and the ten-point program with reference to mechanical safety adopted by the Automobile Manufacturers Association last November. It was also urged that a new standard for replacement parts be established, that the services of the U. S. Census Bureau be expanded to permit a more thorough breakdown of accident reports, that a coordinated highway building program be established, and that there be an immediate cessation of the practice of diverting automobile taxes to other than highway use.

The financial statement of the Peugeot Automobile Co., Paris, France, for the year ending Oct. 31, 1935 shows a net profit of 45,944,230 francs compared with a net profit in the preceding year of 38,312,185 francs.

CALENDAR OF COMING EVENTS

SHOWS

Hungary, Automobile Show, Budapest, Mar.-April
Illinois Automotive Parts Assoc., Maintenance Exhibit, Navy Pier, Chicago .....April 4-8
Portugal, Automobile Show, Lisbon, begins April 16
Seventh Midwest Power Exposition, Chicago .....April 20-24
Yugoslavia, Automobile Show, Zagreb, May 2-11
Foundry and Allied Industries Exposition, Detroit .....May 4-9
Spain, Automobile Show, Madrid, May 10-20
International Aero Exhibition, Stockholm, Sweden .....May 15-June 1
International Petroleum Exposition, Tulsa, Okla. .....May 16-23
Morocco, Fair of Tangiers.....May 16-24
Yugoslavia 16th International Spring Fair, Lubliana .....May 30-June 11
France, Automobile Exhibit at Foire de Paris .....May
Norway, Automobile Show, Oslo .....May
Olympia Motor Show, London, England, Oct. 15-24
National Automobile Show, Grand Central Palace, New York.....Nov. 11-18
International Aviation Show, Paris, France .....Nov. 13-29
Columbus Automobile Show.....Nov. 14-20
Chicago Automobile Show.....Nov. 14-21
Detroit Automobile Show .....Nov. 14-21
Cincinnati Automobile Show ....Nov. 15-21
Baltimore Automobile Show ....Nov. 21-28
Brooklyn Automobile Show ...Nov. 21-28*
Cleveland Automobile Show....Nov. 21-28*
Kansas City Automobile Show..Nov. 21-29*
Milwaukee Automobile Show ....Nov. 22-29
Peoria Automobile Show ..Nov. 30-Dec. 5*
Philadelphia Automobile Show, Nov. 30-Dec. 5*
Natl. Exposition of Power & Mechanical Engineering, Biennial Meeting, New York City .....Nov. 30-Dec. 5
International Commercial Motor Transport Exhibition, London, England, November

* Tentative dates.

CONVENTIONS AND MEETINGS

American Chemical Society, 91st Annual Meeting, Kansas City, Mo....April 13-17
S.A.E. Tractor and Industrial Power Meeting, Milwaukee, Wis..April 15-16
American Gear Manufacturers Association, Twentieth Annual Convention, Philadelphia .....April 20-21
S.A.E. Production Meeting, Detroit, Mich. .....April 21-24
Natl. Metal Trades, Annual Meeting, New York City.....April 22-23
U. S. Chamber of Commerce, Annual Meeting, Washington .....April 27-30
American Foundrymen's Association 40th Annual Convention, Detroit, May 4-9
American Petroleum Institute Mid-Year Meeting, Tulsa, Okla..May 13-15
National Battery Manufacturers Association, Spring Convention, Cleveland .....May 20-21
American Iron & Steel Institute, Annual Meeting, New York City..May 21
S.A.E. Summer Meeting, White Sulphur Springs, W. Va. .....May 31-June 6
Automotive Engine Rebuilders Assoc. Annual Convention, Cincinnati, June 1-4
American Society for Testing Materials, Annual Meeting, Atlantic City .....June 29-July 3
National Association Power Engineers, Annual Meeting, Chicago, Aug. 31-Sept. 4
American Society for Metals, 18th Nat'l Congress, Cleveland, O. ....Oct. 19-23
American Gas Association, Annual Meeting, Atlantic City.....Oct. 26-31
American Petroleum Institute, Annual Meeting, Chicago .....Nov. 9-12
Natl. Industrial Traffic League, Annual Meeting, New York City....Nov. 19-20

Research on the

Throughout this Indianapolis plant are adequately manned research stations with special equipment, augmenting the larger laboratories.

ON occasion we have discussed some of the parts manufacturing plants, emphasizing their value to the automotive industry not only for the product they make but in their role as research departments of the industry.

One of the outstanding examples in this category is P. R. Mallory & Co., Indianapolis, Ind., whose plant we visited recently. Here is a very energetic, if compact, organization. And its most significant attribute immediately evident to the outsider is an immense activity in research both fundamental and commercial. For a small company, the research facilities are really exceptional in variety and budget.

In addition to the larger laboratories in the metallurgical and electrical departments, one finds small cubicles tucked away in unexpected corners, each with special equipment and adequately manned. The cost of such enterprise must run into an appreciable percentage of annual sales but it is well justified because research is the life blood of a technical organization of this character.

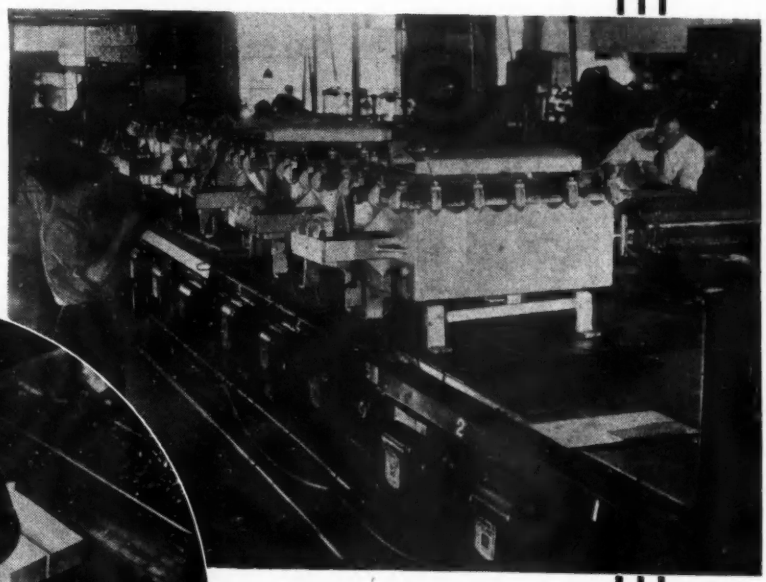
Mallory is one of the principal factors in the metallurgical field, particularly in the rare metals such as the tungsten and silver alloys. The metallurgical division has specialized in many things of unique automotive interest — contact points for ignition breaker mechanism, contacts for horns and control elements, contacts for radio vibrators, and alloys for welding machine parts and welding electrodes of the familiar materials such as Mallory 3, Elkaloy, Elkonite, etc. There is an enterprising electrical division

(Left) Life-testing ignition distributors to study standard and new contact point materials.

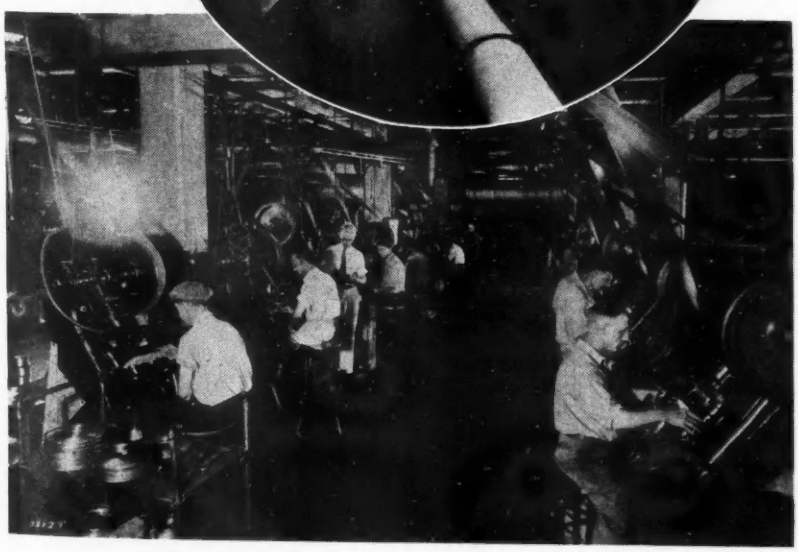
(Right) Electrolytic condensers are tested 100 per cent in production on this double-tiered merry-go-round table. Condensers are clipped to charged terminals and held in place for several minutes. Readings are taken at each station to determine whether condenser behavior is within required limits.

e Spot

By Joseph Geschelin



(Right) Battery of electrically-fired, hydrogen atmosphere furnaces used for brazing operation on tungsten contact breaker points.



General view in punch press department.

(Center) After brazing, the ignition contact screws and breaker arms are inspected under a powerful magnifying glass for examination of brazed joint and condition of the tungsten contact surface.

whose most important contribution is in the automotive radio field, producing switches, electrolytic condensers, vibrators, etc. In addition, the electrical division makes automobile battery chargers and a special line of compact rectifiers for many purposes.

In the technical organization are found some of the leading specialists in their field, including well-known names in physics, chemistry and electrical engineering. These men are responsible not only for fundamental research but for the development of alloys and instruments to meet specific problems occurring in their line of experience. And some of the special research departments also are responsible for the development of special production equipment and inspection devices required in the manufacture of new lines.

It is certainly of interest to automotive men to learn that the metallurgical department played a big role in the early reduction to practice of the cemented-tungsten-carbide materials and today is one of the best informed sources of information on the fast-growing technique of powder metallurgy.

Around Detroit, Mallory enjoys an enviable reputation as an expert in the welding art, for this organization was the primary force in promoting the use of water-cooled welding electrodes, in the development of hardenable high conductivity copper alloys for welding tips, and in the development of hardenable Mallory 3 casting alloys for welding machine elements and for large welding dies such as are used on flash welders.

A few of the interesting high spots of the Mallory plant and its research facilities are shown in the accompanying illustrations.

Table I—Net Profit on Sales and Return on Investment—1935

(All Departments)

	No. of Dealers	Sales	Net Capital Investment	Net Profit	Net Profit as % of Sales	Return on Investment
All Makes	314	$90,240,056	$12,314,745	$951,818	1.05%	7.7%
Ford	50	17,284,985	2,544,266	114,256	0.66	4.5
Chevrolet Exclusive	77	21,479,562	2,273,293	236,277	1.09	10.4
Other General Motors	91	23,641,948	3,641,444	310,084	1.30	8.5
Dodge	21	7,978,471	1,279,654	91,044	1.14	7.1
Chrysler	31	9,834,218	1,054,593	95,219	0.96	9.0
Misc. Makes	44	10,020,873	1,521,495	92,037	0.91	6.0

$3.29 per Used Car

Table II—Longer Trades Offset Discount Increases

Three-Year Trend of Retail New and Used Car Sales Department Ratios

No. of Dealers	All Makes	Ford	Chevrolet Exclusive	Other General Motors	Dodge	Chrysler	Misc. Makes
1933-1934	255	58	76	57	18	19	27
1935	314	50	77	91	21	31	44
N. C. Gross Profit as % of N.C. Sales							
1933	23.47	18.88	24.26	25.68	23.82	21.94	23.22
1934	21.13	19.24	21.71	22.80	20.65	19.83	20.17
1935	21.45	18.59	22.35	23.36	21.98	19.27	20.92
U.C. Gross Profit or Loss as % of U.C. Sales							
1933	7.49*	3.65*	6.70*	9.88*	2.90*	3.41*	6.49*
1934	1.00*	1.20	0.94*	1.97*	1.60*	1.73	2.53
1935	4.60*	0.18	8.26*	8.00*	5.44*	2.96*	2.62*
N. & U. C. Gross Profit Salvaged as % of N. & U.C. Sales							
1933	13.71	12.12	14.03	14.51	16.62	13.82	13.49
1934	14.26	13.79	14.34	15.27	15.51	13.77	14.48
1935	13.39	13.12	13.13	13.89	14.10	11.77	13.80
N.C. Expense as % of N.C. Sales							
1933	13.03	14.93	12.41	12.17	13.34	12.00	15.06
1934	13.68	14.11	13.23	13.52	13.76	13.46	14.93
1935	12.97	13.19	12.26	12.97	15.00	12.15	13.33
U.C. Expense as % of U.C. Sales							
1933	16.95	15.04	16.90	17.77	19.28	15.53	17.43
1934	16.91	14.66	16.99	18.15	19.74	14.40	18.45
1935	15.86	15.70	16.36	15.40	16.07	12.93	17.96
N. & U.C. Expense as % of N. & U.C. Sales							
1933	14.27	14.96	13.88	13.93	14.94	13.13	15.85
1934	14.68	14.28	14.45	14.93	15.37	13.79	16.06
1935	13.86	13.93	13.60	13.70	15.31	12.41	14.73
N.C. Net Profit as % of N.C. Sales							
1933	10.44	3.95	11.85	13.51	10.48	9.94	8.16
1934	7.45	5.13	8.48	9.28	6.89	6.37	5.24
1935	8.48	5.39	10.08	10.39	6.97	7.13	7.59
U.C. Net LOSS as % of U.C. Sales							
1933	24.44	18.69	23.60	27.65	22.18	18.94	23.92
1934	17.91	13.46	17.93	20.12	18.15	12.67	15.92
1935	20.46	15.52	24.62	23.40	21.51	15.89	20.58
N. & U.C. Net Profit as % of N. & U.C. Sales							
1933	0.56*	2.84*	0.15	0.58	1.68	0.69	2.36*
1934	0.42*	0.49*	0.11*	0.34	0.14	0.02*	1.58*
1935	0.47*	0.81*	0.47*	0.19	1.21*	0.64*	0.93*

* LOSS

Used car gross profit or loss is after inventory adjustments and finance reserves.

r Holds Dealers in 'Red'

Bigger volume and reduced new car department expense fail to improve combined new and used car situation.

By Don Blanchard
Editor Automobile Trade Journal

RETAIL new and used car departments again are portrayed as the weak sisters of the dealer's departmental family by the survey of 1935 operations just completed by Edward Payton for the Pennsylvania Automotive Association.

On combined retail new and used car sales volume of $68,465,777, the 314 Pennsylvania dealers who participated in the survey reported a net loss after finance reserves of $320,804, or 0.47 per cent on the volume.

The 1935 loss ratio on combined new and used car sales was slightly greater than the 1934 survey showed despite the fact that average retail new car volume per dealer was 28 per cent larger.

New car gross margins were moderately larger—0.32 per cent of sales for the group.

But used car gross losses jumped from 1.00 per cent of used car sales in 1934 to 4.60 per cent, after adjustments and finance reserves, in 1935.

As a result gross profit salvaged on combined new and used cars at retail dropped from 14.26 to 13.39 per cent despite the increase in new car gross margins, which is something for those who hold longer new car discounts are the answer to ponder.

Ford dealers, with the shortest new car margins, were the only group to show a used car gross profit. General Motors dealers, other than exclusive Chevrolet, enjoyed the largest new car gross margin, but they also had next to the largest percentage of used car gross loss on used car sales.

However, General Motors dealers, other than exclusive Chevrolet, were the only group to show a net profit on combined new and used car sales.

If the 314 dealers had allowed an average of $3.29 less for each of the 97,507 used cars they sold, they would have broken even on combined new and used car sales, indicating that the last $5 of allowance is well worth fighting about.

Profits on service and stockroom departments amounting to $978,791, were in excess of the total net profit from all departments which amounted to $951,818, or 1.05 per cent on the gross volume from all departments of $90,240,056.

The 1.05 per cent on volume was an improvement over the net-to-sales ratios reported in last year's survey for 1934 and 1933 which were 0.69 and 0.55 per cent respectively.

Net capital investment was reported for the first time this year and is given in the survey at $12,314,745 for the 314 dealers. The return was 7.7 per cent.

Table III—Profit vs. Volume Per Dealer
(Retail New and Used Car Departments ONLY)

	1933	1934	1935
All Makes			
New Car Volume	$ 98,000	$118,000	$151,000
New Car Units	128	151	188
Net on New and Used Cars	$ 796*	$ 726*	$ 1,020*
Ford			
New Car Volume	$ 74,600	$117,000	$197,000
New Car Units	108	179	292
Net on New and Used Cars	$ 3,040*	$ 825*	$ 2,280*
Chevrolet Exclusive			
New Car Volume	$114,000	$123,000	$157,000
New Car Units	175	177	219
Net on New and Used Cars	$ 263	$ 201*	$ 1,090*
Other General Motors			
New Car Volume	$116,000	$131,000	$146,000
New Car Units	113	124	149
Net on New and Used Cars	$ 985	$ 637	$ 400
Dodge			
New Car Volume	$121,000	$152,000	$163,000
New Car Units	158	188	200
Net on New and Used Cars	$ 2,790	$ 294	$ 2,750*
Chrysler			
New Car Volume	$ 74,200	$ 87,600	$105,000
New Car Units	99	110	130
Net on New and Used Cars	$ 754	$ 26*	$ 1,010*
Misc. Makes			
New Car Volume	$ 64,500	$ 71,200	$124,000
New Car Units	70	75	129
Net on New and Used Cars	$ 2,260*	$ 1,660*	$ 1,670*

*LOSS

Table IV—Parts and Service Earn the Profits—1935
Profits and Owners' Salaries per Dealer—1935

	Profits from All Departments per Dealer	Parts and Service Profits per Dealer	Owners' and Officers Salaries
All Makes	$3,030	$3,110	$4,095
Ford	2,290	3,800	5,394
Chevrolet Exclusive	3,060	4,170	3,717
Other General Motors	3,410	2,810	3,813
Dodge	4,330	2,900	6,004
Chrysler	3,070	1,150	2,943
Misc. Makes	2.090	2,640	3,764

General Motors dealers, other than exclusive Chevrolet, led the field with a net-to-sales ratio of 1.30 per cent while the exclusive Chevrolet group was first in return on investment with 10.4 per cent.

As a group, borrowings of the 314 dealers to stock cars amounted to $4,027,493 against new car inventories of $3,824,544 and used car stocks of $2,606,609.

The three year trend in the percentages of service department gross and net profits was slightly downward, while stockroom gross and net percentages were fairly stable.

Owners' and officers' salaries averaged $4,095 per dealer according to the survey against an average net profit per dealer of $3,030 and average gross volume of $287,000.

Before discussing some of the points in the foregoing highspot summary, let us pause to note that the 314 dealers who participated in the 1935 survey represent about 10 per cent of the total outlets in Pennsylvania and they retailed about 25 per cent of the new cars and trucks delivered in that State last year. Obviously they were bigger than average dealers, the average number of new units retailed per dealer in the survey being 188 against 74 new units average for all Pennsylvania dealers.

In considering comparisons between 1935 and the two previous years, it should be remembered that the groups are not identical. The 1933 and 1934 results are based on the same 255 dealers, but since there are 314 in the 1935 survey it is obvious that last year's group is different. However, it is felt that these differences in the make-up of the group do not invalidate entirely the comparisons that are made.

Table II shows the three-year trend of retail new and used car sales department ratios. The new car gross margin percentage of 314 dealers rose from 21.13 per cent in 1934 to 21.45 per cent in 1935—an increase of 0.32 per cent which on the volume of business done amounted to $151,000. All groups shared in this increase except Ford dealers who reported 0.65 per cent less gross margin than in 1934.

Used car gross losses turned sharply upward from 1.00 per cent in 1934 to 4.60 per cent in 1935, perhaps due to the lapse of the code and the intensification of competition. Only Ford dealers were able to show a used car gross profit after inventory adjustments and finance reserves. It is interesting, if not significant, that the groups with the highest gross margin ratios also show the highest used car gross loss percentages.

New and used car gross profit salvaged as a percentage of new and used car sales shows a decline for the 314 dealers and for each of the "by-makes" groups. This decrease took place despite the fact that all dealers, except Ford, received larger gross margins on new cars than in 1934. Moreover, while the four groups with new car gross margins in excess of 23 per cent all salvaged more than 13 per cent gross profit on combined new and used cars so did the Ford dealers with a new car gross margin of 18.88 per cent. On the other hand, the Chrysler group with a new car gross margin of 21.66 was able to salvage only 11.77 on combined new and used cars. In general, however, there is little in these figures to support the contention that increased new car discounts alone would improve dealer profits.

New car department expense ratios

Table V—$5 Cut in Allowances Per New Car Would Give Break-Even in Retail Car Departments

Retail New and Used Car Departments ONLY—Per New Car in 1935

	All Makes	Ford	Chevrolet Exclusive	Other General Motors	Dodge	Chrysler	Misc. Makes
1. New Car Selling Price	$803	$676	$714	$981	$814	$811	$958
2. New Car Gross Profit	172	125	160	229	179	158	201
3. New Car Expense	104	89	88	127	122	99	128
4. New Car Net Profit	68	36	72	102	57	57	73
5. Used Car Sales per New Car	359	285	348	424	328	413	416
6. Used Car Gross Loss per New Car	24*	9*	29*	43*	23*	17*	14*
7. Used Car Expense per New Car	57	45	57	65	53	53	75
8. Used Car Net Loss per New Car	82	54	86	108	76	70	89
9. Less Traceable Finance Reserve	8	10	9	9	5	4	4
10. Final Average Used Car Net Loss per New Car.	74	44	77	99	71	66	85
11. New and Used Car Gross Profit per New Car	148	116	131	186	156	140	186
12. New and Used Car Expense per New Car	161	134	145	192	175	152	203
13. †New and Used Car Net Profit or Loss per New Car	5*	8*	5*	3	14*	8*	13*

*LOSS
†Including finance reserve line 9

Table VI

	Service Department Ratios						*Stockroom Ratios*					
	Gross Profit % of Service Sales			Net Profit % of Service Sales			Gross Profit % of Stockroom Sales			Net Profit % of Stockroom Sales		
	1933	1934	1935	1933	1934	1935	1933	1934	1935	1933	1934	1935
All Makes	50.10	47.91	46.91	3.75	3.01	2.73	27.16	27.96	27.11	9.40	10.54	10.25
Ford	46.30	41.90	40.32	5.10	4.90	1.24*	29.40	29.90	29.52	6.60	8.40	11.09
Chevrolet Exclusive	54.20	51.80	51.72	7.00	4.40	7.20	26.20	27.20	26.34	9.68	11.05	10.75
Other Gen. Motors	53.50	52.20	48.95	1.69	0.60	0.75	28.70	29.20	26.34	12.60	13.70	11.05
Dodge	47.00	45.60	42.22	0.70*	0.60	1.91	26.70	28.70	26.64	8.85	9.85	9.43
Chrysler	42.50	42.10	41.23	2.70	1.90	1.20	22.20	25.20	23.83	11.30	14.30	5.65
Misc. Makes	39.50	40.80	42.84	1.60	4.40	3.24	24.00	22.80	27.81	11.50	9.30	9.19

*LOSS

with the exception of the Dodge group were uniformly lower than in 1934, increased volume probably accounting for this improvement. Used car department expense ratios also were down with Ford the exception in this case. Combined new and used car department expense ratios were lower for all groups.

Net profit in the new car department increased in 1935 and in general the dealers with the larger discounts show the larger profits in this department although curiously enough Chrysler dealers show up better than the Dodge group on this score although the latter group got over 2 per cent more new car gross margin.

Used car department net losses are uniformly higher.

On combined new and used cars, de-

Table VII—Summary of the PAA Survey of 1935 Dealer Operations

	All Makes	Ford	Chevrolet Exclusive	All General Motors	Dodge	Chrysler	Miscellaneous Makes
Number of Dealers	314	50	77	91	21	31	44
Wholesale New Cars	12,307	361	183	1,271	3,607	6,244	641
Retail New Cars	58,891	14,601	16,852	13,529	4,190	4,016	5,695
Used Cars	97,507	20,853	29,080	23,678	6,546	7,322	10,028
Net Capital Investment	$12,314,745	$2,544,266	$2,273,293	$3,641,444	$1,279,654	$1,054,593	$1,521,495
Borrowed to Stock Cars	4,027,493	863,676	712,361	1,300,757	317,105	327,415	506,177
New Car Inventories	3,824,544	737,693	797,832	1,094,817	319,246	387,729	487,226
Used Car Inventories	2,606,609	490,669	621,434	742,837	195,180	208,851	347,638
Sales All Departments	$90,240,056	$17,284,985	$21,479,562	$23,641,948	$7,978,471	$9,834,218	$10,020,873
Wholesale New Car	7,983,338	182,037	88,699	917,293	2,221,757	4,060,093	513,459
Retail New Car	47,303,532	9,867,769	12,036,046	13,267,594	3,415,956	3,258,246	5,457,921
Retail Used Car	21,162,245	4,162,712	5,859,828	5,734,116	1,376,684	1,659,449	2,369,455
Retail New and Used Car	68,465,777	14,030,481	17,895,874	19,001,710	4,792,640	4,917,696	7,827,376
Service	5,793,032	1,220,309	1,529,744	1,686,897	399,217	307,141	649,724
Stockroom	7,997,909	1,852,158	1,965,244	2,036,048	564,858	549,288	1,030,312
Gross Profit Salvaged:							
All Departments	14,004,441	2,757,211	3,521,471	3,953,473	1,099,570	1,015,691	1,654,025
Wholesale New Cars	416,423	18,251	6,819	47,779	117,702	196,738	29,134
Retail New Cars	10,144,742	1,834,386	2,689,533	3,099,588	750,865	628,056	1,142,314
Retail Used Cars	973,677*	7,402	338,714*	459,187*	74,839*	49,113*	62,226*
Retail New and Used Car	9,171,065	1,841,788	2,350,819	2,640,401	676,026	578,943	1,080,088
Service	2,717,900	492,012	791,228	861,125	168,556	126,622	278,357
Stockroom	2,168,804	546,711	517,721	536,298	150,532	130,943	286,600
Net Profit:							
All Depts. (after adjustments)	951,818	114,256	236,277	310,084	91,044	95,219	92,037
Wholesale New Cars	212,926	8,817	289*	37,546	69,536	76,777	20,538
Retail New Cars	4,009,665	532,323	1,213,690	1,378,529	238,301	232,304	414,518
Retail Used Cars	4,330,469*	646,281*	1,297,619*	1,342,002*	296,133*	263,664*	487,771*
Retail New and Used Cars	320,804*	113,958*	83,929*	36,527	57,832*	31,360*	73,253*
Service	158,573	15,277*	110,179	31,082	7,635	3,882	21,072
Stockroom	820,278	205,243	211,187	224,918	53,293	31,059	94,579

*LOSS

Gross Profit Salvaged is after discounts. Used Car Gross Loss is after finance reserve. Net Profit, All Departments is after miscellaneous income and deductions.

spite substantial increases in volume, the profit position in 1935 was worse than in 1934, according to the survey. For the entire group, net loss on combined new and used cars increased from 0.42 per cent of sales in 1934 to 0.47 per cent in 1935. Only the miscellaneous makes group was able to reverse this unfavorable trend with a percentage of loss that was less than in 1934.

Further light is shed on the situation by Table III which shows that while the average retail new car sales per dealer participating increased from 151 units and $118,000 in volume in 1934 to 188 units and $151,000 in volume in 1935, this substantial increase in volume brought not an improvement in profits on combined new and used car sales, but a material increase in net loss on this business. Moreover, not a single group of the six "by makes" classifications was able to increase profits or reduce losses per dealer on combined new and used car sales in 1935 although all groups enjoyed marked increased in sales per dealer.

Dealers generally probably do not realize just how sensitive profits on their combined new and used car retail sales are to small differences in used car allowances—at least the abandon with which some dealers raise allowances in $25 jumps does not indicate that they are aware of what a big difference a few dollars makes. The survey shows that if the 314 dealers had allowed an average of $3.29 less for each of the 97,507 used cars they sold, they would have broken even on their combined retail new and used car operation. Five dollars less allowance per used car would have put them in the black!

Of course dealers don't need surveys to prove to them that the crux of their problem is that they allow too much for used cars. To a degree the situation is within their control but when year after year large groups of dealers report that they are handling three quarters of their volume at a net loss, the indications are that there are also vitally important influences at work which are beyond the control of the dealers.

In our opinion, the most potent of these influences are (1) the number of cars produced in relation to the number dealers can sell on a basis that will yield them a proper margin of gross profit on combined new and used car volume, and (2) in some territories the unjustified expansion of retail selling costs by the appointment of too many dealers.

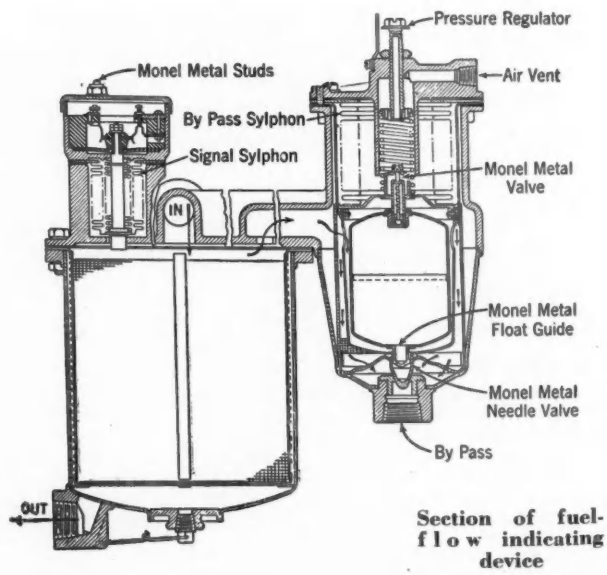
Much additional information developed by the survey is presented in the accompanying tables all of which merit careful study. Copies of the survey report may be obtained from the Pennsylvania Automotive Association, P.O. Box 229, Harrisburg, Pa., at the following rates: Single copies, $1; 10 copies, $5; 25 copies, $10; 50 copies, $17.50; 100 copies, $25.

Airplane Pilots Can Be Warned of Diminished Fuel Supply by New Device

A SAFETY device which gives warning to the airplane pilot when there is any interruption in the flow of fuel from the tank to the pump has been placed in production by the Steel Products Engineering Co. of Springfield, Ohio. The accompanying sectional view of the device is reproduced from INCO. The instrument is composed of two principal parts. The fuel enters the main bowl at the top, filling it and driving the air ahead of it through the cored passage in the top casting. The air is then forced into a by-pass and an air-vent chamber to be exhausted above the tanks.

When the fuel level reaches the top of both chambers, it raises the float in the smaller chamber, a Monel metal needle valve attached to the float closing the air vent. Pressure is then built up to a predetermined point which is easily controlled by the pressure regulator with an indicator graduated in pounds.

This pressure is sufficient to collapse the signal sylphon above the main bowl, breaking the electrical contact which serves the signal light on the instrument board. The light remains off as long as pressure is maintained and, since the air valve is actuated by the fuel level alone and is not sensitive to pressure, the light control is not affected by air which may enter the system in changing the fuel source. The reservoir bowl contains a strainer of sufficient capacity to require cleaning only after a hundred or more hours of service. Those parts of the device subject to corrosion and erosion are of Monel metal.



Section of fuel-flow indicating device

JUST AMONG OURSELVES

Dubonnet Brings An Interesting Car

THE Dubonnet car, which arrived with its inventor via S.S. Paris on April 8, seems to us to be about the most interesting design to progress beyond the paper stage since all the talk started about combining streamlining, rear engine mounting, and independent wheel-suspension.

The car has received considerable acclaim in Europe, and leaves behind on this visit to the United States some very definite accomplishments in the fields of speed and economy.

When Sir Dennistoun Burney brought his design to the United States, it lacked interest for many observers because, from the American point of view, it was excessively underpowered, and there was no immediate answer to the question "how big an engine will it need to attract American buyers?" Monsieur Dubonnet has neatly forestalled this query by powering his car with a standard Ford V-8 engine.

If the inventor follows the course he laid down in Europe, he will welcome practical tests of his car in comparison with American stock cars of similar and even higher power ranges.

Figures Are On The Up And Up

VISITING around in New York on Tuesday, we found General Motors people exultant over March sales figures for the corporation, which were the largest since June of 1929. At the Automobile Manufacturers Association, the atmosphere wasn't exactly gloomy, when in the late afternoon figures were compiled to show that production in March by manufacturer-members of the association was 47 per cent over the February figure. Into the general air of jubilation, we threw a question about exports, and got an educated guess that they would go about 25 per cent higher than last year for the whole of this year. That isn't so bad either, and we spent the rest of the day polishing the end of our slide rule which takes care of favorable percentages.

Fruits From The Safety Tree

THE A.M.A. had to show a set of education material on safety which has been made up by the National Safety Council as part of an activity made possible by a grant from the automobile manufacturers. Designed for use by cooperating newspapers, it gives them the meat for a consistent, balanced campaign, with the heavy emphasis on education against and not the horror arising out of motor-vehicle accidents.

We have sometimes looked with amazement on the "publicity presentations" which are made up to promote a single product of the motion-picture capital in Hollywood. If the publicity planning which went into the promotion of a single "Tarzan" picture, for example, were devoted to a single phase of safety, the results would surpass anything we have yet seen. We don't advocate the more sensational aspects of the Hollywood method, but there's a lot to be said for making safety publicity "look" important. The new campaign achieves that end, and should be particularly effective.

S.A.E. Provides A Safety Vent

THE forthcoming semi-annual meeting of the Society of Automotive Engineers, to be held at White Sulphur Springs at the end of May, promises to have several unusual aspects. From the attendance standpoint, we predict that there will be an unusually large sprinkling of important engineer-executives present, and that many of the ordinary sessions will be made more interesting by their presence.

We, ourselves, look forward with special interest to an off-the-record session, during which reporting of any kind will be excluded, and from a panel of questions submitted by members of the society, there will be drawn a number for free, and untrammeled discussion. The word's out that criticism will "go the limit" so long as it does not involve personalities.

An executive who is very close to top of our industry and who doesn't often get into public discussion, but when he does, is noted for not pulling his punches, will be in the chair at the session, flanked by other executives who are competent to discuss both engineering and sales of motor vehicles.

The only reason for withholding names is in case of a last minute necessity which would prevent one of the "jury" (and they may turn out to be defendants, too) from attending. Those who have promised to function are important enough so that a necessary change of plan might cause more comment that would otherwise be justified.

Maybe it's news when an editor promotes an event he isn't going to be allowed to report. Any way you look at it, the S.A.E. deserves credit for giving an outlet to frank criticism of the products of the industry it serves so well. —H. H.

By W. F. Bradley

New Dubonnet...

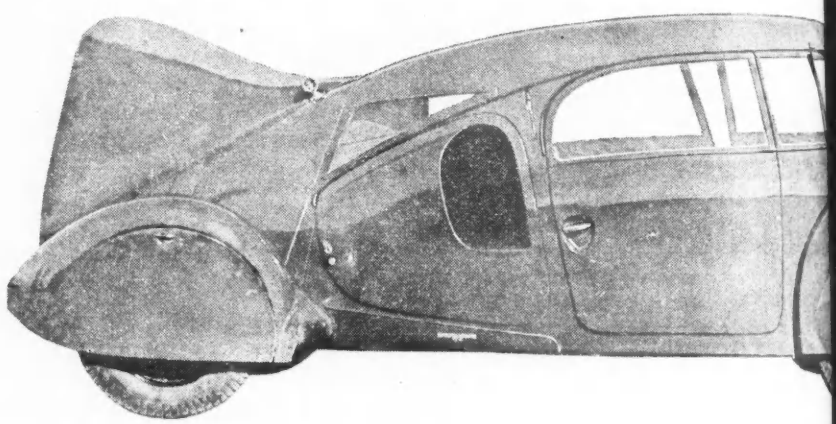
comes with advance body style and engine in rear. Test runs show fuel economy.

LANDING this week from the "Paris," André Dubonnet, wealthy French sportsman and engineer will bring for presentation to the American automotive industries two cars of advanced design. One of these is a rear-engined, rear drive job embodying the latest European practice in streamlining, the other apparently a standard Ford equipped with the Sensaud de Lavaud hydraulic transmission.

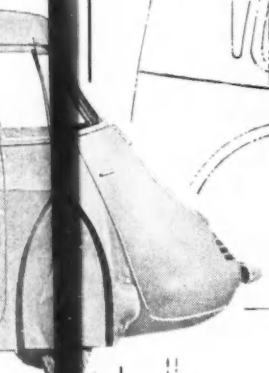
Dubonnet is the inventor of the suspension adopted by Pontiac, Vauxhall and Fiat and he has incorporated this in his new car, both front and rear. In order to facilitate comparisons, he has adopted as the powerplant a Ford V-eight, which has not been modified in any way. The Ford transmission has been discarded and its place taken by a Cotal four-speed planetary set with electro-magnetic control. The final ratio is 2.92 to 1.

The usual side-rail construction for the chassis has been discarded for a box section, broadening out at four points to carry the suspension and narrowed at the front where the steering gear is mounted. Sheet steel of 2-mm. (0.080-in.) is used throughout the frame construction. The entire undersurface of the car is enclosed, but advantage is taken of the box section to deliver a current of air through the frame to the lower portion of the engine.

The entire powerplant—engine, transmission and differential—is ahead of the axle. The differential being carried in the frame, the drive is taken to



On this and the facing page are shown views of the Dubonnet rear - engined, rear-drive car with streamlined body developed by wind tunnel tests



the rear wheels by double-universal-jointed shafts.

Cooling is assured by an inclined radiator placed behind the engine with a belt-driven fan carried on a horizontal shaft back of this. Air is drawn in through a scoop just back of the main door on each side of the car, passed over the engine and through the radiator, and is then discharged through slots in the tail. The spare wheel is carried transversely just ahead of the engine and back of the main seat rest. The battery box is in the same compartment. As the transmission has electric control, all difficulty with long rods is avoided. The only distant controls are for the carburetor and ignition.

The form of streamlining has been adopted after extensive tests in a wind tunnel and consultation with French experts. With a total height of 65 in., the height of the floor is 14 in. and the internal height of the body 51 in. The internal width at the center is 55½ in. Access to the main seats is by a wide door on each side. Access to the driving compartment is by a door forming half of the nose panel. Being between the steering wheels, the forward compartment is narrower than the central portion of the body. One of the distinctive features of the body construction is that the steering wheels are inclosed. The housings surrounding them turn with the wheels but do not move up and down with them. There is a central headlight set flush in the nose of the body, and in addition there are two lateral headlights recessed in the body just ahead of the front wheels.

Just before leaving for the United States, André Dubonnet carried out speed and economy tests, on Montlhery track, under the official control of the Technical Committee of the Automobile Club of France. To obtain comparisons, a standard Ford was obtained from a local dealer and was driven by Albert Divo, a well-known French racing driver. Both engines were tested on the bench before the track runs, the Dubonet engine, which was bought nearly two years ago, peaking with 72 h.p. at 4000, and the later model Ford showing 80 at the same speed. With tanks full, the Dubonnet car scaled 3047 lb., while the weight of the standard Ford was 3058 lb.

In a test run on Montlhery track, with a wind averaging 40 ft. per sec., the standard Ford attained a speed of 79.53 m.p.h. for one lap. The previous day, running alone in still air, the Ford had lapped at 81.4 m.p.h. The Dubonnet car, driven by André Dubonnet, lapped at 108.35 m.p.h. This was followed by a fuel economy test of one hour at a speed of 62 m.p.h., when the standard Ford consumed 4.057 U. S. gals. of gasoline and the Dubonnet job, 2.862 U. S. gals. A second fuel economy test was run on the Montlhery road track, which is slightly hilly and very winding. An average speed of 59.6 m.p.h. was maintained by both cars for a distance of 31 miles. To maintain this average, the gears had to be used rather freely. On this test the standard Ford consumed 3.805 U. S. gals., while the Dubonnet consumed 2.972 gals. While the total advantage is entirely in favor of the Dubonnet, it will be seen that the difference is most apparent in the high speed run on the banked track, where the Dubonnet had the advantage of the low gear ratio of 2.92, compared with the standard ratio of the Ford.

After experimenting for six years, M. Sensaud de Lavaud has entrusted a hydraulic transmission of his invention, fitted in a Ford car, for presentation to the American industry by André Dubonnet. Because of the patent situation, the inventor is not prepared at present to reveal the details of its construction. He has applied his job to a standard V-eight Ford, the turbine occupying the place of the normal Ford transmission.

The turbine and the reserve tank contain slightly less than two gallons of oil. When last shown to engineers, a couple of years ago, the Sensaud de Lavaud transmission showed itself inferior to a normal mechanical transmission in the matter of acceleration. This deficiency has been removed, the hydraulic now being equal in every respect to shift gears in the hands of a skilled driver. Usually, in tests, the mechanical job will get a slight lead in the first few yards, owing to the more flexible take up of the hydraulic, but this initial advantage is wiped out in less than thirty yards.

An electro-magnetic lock, with a push button operated by the foot, provides a direct drive when desired. To prevent grabbing when the electric clutch takes hold, a hydraulic shock absorber is incorporated in the device. An opportunity of testing the Sensaud de Lavaud gear on short steep hills of 11 to 13 per cent was given the writer, when the impression was gained that the pick up was just as good as with the ordinary transmission, and the car was much more agreeable to handle. On one of these hills the sidewalk consists of steps, and these were climbed with the use of the hydraulic gear with ease. The changes from hydraulic to direct drive and vice versa were made with absolute sweetness, the only indication that the car was running on hydraulic being a slight change in tone. The oil remained at 80 to 90 deg. Fahr. in ordinary running and rose to 130 deg. during continuous work on hills.

It is stated that the Fiat Company, after extensive tests in the Alps, has secured an option on this hydraulic transmission.

To Determine Thickness of Plating

AN ingenious method of determining the thickness of plated coatings has been evolved by F. C. Mesle of the National Bureau of Standards.

If a coating on a curved surface is just cut through with a flat file, or that on a flat surface is cut through with a grinding wheel of known radius, the thickness of the coating can be computed from the equation

$$T = \frac{C^2}{8R},$$

where T is the thickness, C is the chord, that is, the width of the cut, and R is the radius of the curved surface or of the grinding wheel.

To apply the method to a practically plane surface, the latter is tilted slightly, so that a tapering cut is produced when the surface is passed under the grinding wheel in a direction parallel to its axis. The chord is then measured just at the point where the base metal is exposed. This procedure is especially valuable for measuring the individual layers in multiple coatings, such as of nickel, copper, and nickel on steel.

For testing deposits on soft base-metals such as copper, brass and zinc-base die-castings, a wheel with a relatively coarse grain, such as a 90-grain, is preferable. On steel, a 120-grain wheel gives sharper cuts. The width of the cut is measured with a lens and scale.

Tests made on specimens plated with known thicknesses showed that the method is accurate to about 10 per cent on coatings at least 0.0002 inch (0.005 mm.) thick. It is a much more rapid method than the metallographic examination, and under favorable conditions the results are almost as accurate. In general the tested specimen can be salvaged by stripping, polishing, and replating. This is an advantage in testing large pieces such as bumper bars. It is hoped that after thorough trial this method will prove useful in testing plated products for compliance with specifications.

A more complete account of this work will be found in RP866 in the February number of the *Journal of Research*.

The Horizons of Business

by Joseph Stagg Lawrence

Promoting Depressions

IT was Chief Justice Marshall who phrased the most quoted *obiter dicta* in judicial literature i. e., "The power to tax is the power to destroy." Current developments in taxation frequently recall the wise observation of Marshall. A refinement in this power is taking place which even the Olympian eye of the early jurist did not contemplate. Marshall meant the power of destruction in a literal and direct sense. A 100 per cent tax on real property destroys the equitable right of property held by the owner. For practical purposes that right disappears long before the tax reaches the full 100 per cent. Other rights likewise may be taxed so heavily that they cannot be exercised. State banks have the right legally to issue their own currency. However, at the close of the Civil War the Federal Government imposed an annual tax of 10 per cent on all such notes. Obviously a 10 per cent tax on a note which cannot be loaned at a rate above 6 per cent effectively prevents its issue. These are the direct applications of the power to tax which Marshall had in mind.

Refined Destruction

At present taxation has reached a stage where the ultimate effect may be destruction while the method seems calculated to promote the general welfare. The tax is used to create a condition which more or less subtly undermines the vitality of business or so thoroughly deprives it of necessary defences that it becomes an easy prey to adversity.

This is emphasized anew by the testimony of Dr. H. W. A. Beenhouwer who appeared before the House Ways and Means Committee on the new tax bill. The interest of Dr. Beenhouwer is self-evident and allowance may be made for it. He is a member of the Amsterdam Stock Exchange, sent here by Dutch capitalists with heavy American investments, who were trying to avoid, if possible, or at least reduce, the heavy levies which Congress seems disposed to place upon dividends of foreign owned stocks. The Dutch economist made one suggestion which some Americans had previously made, a suggestion which transcends the narrow interest that he represents. He asked for the elimination of the capital gains tax and Chairman Doughton, a North Carolina Democrat, promptly and frankly said he was opposed to any modification of this tax.

Vote Getting Taxes

Where the surplus corporate earnings tax exudes so much political sex appeal that it can become an asset in a campaign year the capital gains tax is able to match it, campaign year or no campaign year. If a hundred average citizens were stopped on the street and the capital gains tax explained to them as a tax on the difference between the buying and selling price of a security we feel that more than 90 of them would say that it is a good tax. It would seem like a tax, first, upon speculative profits and, secondly, upon an unearned capital increment which accrues to people who are already rich. If they did not see it quite that way without help it would be a poor statesman who could not make it "clear." So long as politics is the art of remaining on the public payroll at a higher salary than could be earned in any other pursuit the public will continue to regard the capital gains tax as well as the corporate surplus tax as wholly just and salutary.

That is where statesmanship and politics part company. The true public servant is guided by the authentic interests of his constituents rather than their superficial approval.

These two taxes constitute an ominous exercise of the tax power because they create conditions which will destroy their objects though they wear the semblance of an equitable and beneficial impost.

Stability and Security

At no time has the need for stabilizing the conditions of business been greater than at present. The duration and severity of the depression measured the price in terms of security and stability which the country must pay for higher living standards. The great efficiency in the production of foods and necessities, the smaller fraction of the nation's energies required for these and the growing fraction devoted to capital goods, luxuries and new satisfactions predisposes the country to greater fluctuations in business. Since luxuries by definition are satisfactions not yet habitual or general to the point of being necessities and capital goods are the instruments of future service it follows that one may be sacrificed and the other postponed as soon as confidence in the future wanes. Thus progress, paradoxically, predisposes us to greater periodic hardships with intervening spells of high and handsome living.

This has been thoroughly recognized by business men, economists and the Government. Business tries to meet this by accumulating the fat of prosperous years to provide sustenance in the lean years. It has also developed a far-reaching system of insurance covering every type of risk which has an actuarial basis. The Government, believing that these safeguards, if adequate at all, reach only the corporation, has sought additional defenses. It is only necessary to mention the A.A.A. which sought stability through crop control, the NRA with production control, one-way wage levels and short hours, unemployment insurance and the Federal Deposit Insurance Corporation. It is possible to grant that the motive of all these measures, at least in part, was security and stability without prejudicing objections to the means.

Economic Differentiation

No one questions the desirability of security and stability provided a latitude for the creative elements in the community is maintained permitting the experimentation and innovation which eventually lead the country from a lower to a higher economic plane. It is difficult to see how the corporate surplus tax and the capital gains tax can be reconciled with this object. The former, to be sure, does not prevent the accumulation of surplus. Its specific fault at this point is that it imposes as a rigid rule what is merely the average custom of all corporations. (The average corporation pays out two-thirds of

(*Turn to page 547, please*)

Mechanical Specifications

These Specifications are brought Up-to-Date Each Month by the

Line Number	MAKE AND MODEL	Lowest Priced 4-door Sedan	Wheelbase (Ins.)	Tire Size (Ins.)	ENGINE: No. of Cylinders, Bore and Stroke	Taxable H.P.	Piston Displacement (Cu. Ins.)	Maximum Brake H.P. at Specified R.P.M.	Compression Ratio (to—1.)	Displacement Factor ††	Cylinder Head Material	Camshaft Drive Make	Piston Material	Oil Cleaner Make	Air Cleaner Make	Carburetor Make	Muffler Make	Electrical System Make	Battery Make	CHASSIS: Clutch Type and Make	Gearset Make	Universals Type and Make	Rear Axle Type and Make	Service Brake Type and Make
1	Auburn.....654	$ 795	120	6.00/16	6-3 1/16x4 3/4	22.5	209.9	85-3500	6.20	37.4	Al..	Whit.	Al...	Pur..	AC..	Str.....	Buf..	A...	USL.	P.Long..	WG..	Nb-Mec	1/2 Col..	BH..
2	Auburn.....852	1095	127	6.50/16	8-3 1/16x4 3/4	30.0	279.9	115-3600	6.50	41.4	Al..	Whit.	Al...	Pur..	AC..	Str.....	Buf..	A...	USL.	P.Long..	Det..	Nb-Mec.	1/2 Col..	BH..
3	Auburn.....SC852	1545	127	7.00/16	8-3 1/16x4 3/4	30.0	279.9	150-4000	6.50	....	Al..	Whit.	Al...	Pur..	AC..	Str.....	Buf..	A...	USL.	P.Long..	Det..	Nb-Mec.	1/2 Col..	BH..
4	Austin.....	....	75	3.75/18	4-2.2x3	7.8	45.6	13-3200	5.30	....	CI..	Spir..	Al...	No...	No...	Til.....	Buf.	A...	USL.	P. Rock..	WG..	F-Spi...	1/2 Sal..	M.m.
5	Buick.....36-40	885	118	6.50/16	8-3 1/2x3 7/8	30.6	233.0	93-3200	5.55	39.6	CI..	LB...	Ala..	No..	AC..	Str.....	Wal..	D...	Del..	P.Own..	Own.	m-Sni...	1/2 Own..	OH..
6	Buick.....36-60	1090	122	7.00/15	8-3 1/16x4 1/8	37.8	320.2	120-3200	5.45	....	CI..	LB...	Ala..	AC..	AC..	Str.....	Wal..	D...	Del..	P.Own..	Own.	m-Spi...	1/2 Own..	OH..
7	Buick.....36-80	1255	131	7.00/16	8-3 1/16x4 1/8	37.8	320.2	120-3200	5.45	40.7	CI..	LB...	Ala..	AC..	AC..	Str.....	Wal..	D...	Del..	P.Own..	Own.	m-Spi...	1/2 Own.	OH..
8	Buick.....36-90	1845	138	7.50/16	8-3 1/16x4 1/8	37.8	320.2	120-3200	5.45	....	CI..	LB...	Ala..	AC..	AC..	Str.....	Wal.	D...	Del..	P.Own..	Own.	m-Spi...	1/2 Own.	OH..
9	Cadillac.....V8-60	1695	121	7.00/16	8-3 5/16x4 1/2	36.4	322.0	125-3400	6.25	45.7	CI..	Mor..	Ala..	No...	AC..	Str.....	Old..	D...	Del..	P.Long..	Own.	Nb-Mec.	1/2 Own..	BH..
10	Cadillac..V8-70 & 75	2445	131-38	7.50/16	8-3 1/2x4 1/2	39.2	346.0	135-3400	6.25	(a)	CI..	Mor..	Ala..	No...	AC..	Str.....	Old..	D...	Del..	P.Long..	Own.	Nb-Mec.	1/2 Own..	BH..
11	Cadillac..V12-80 & 85	3145	131-38	7.50/16	12-3 1/16x4	46.9	368.0	150-3600	6.00	(b)	CI..	Mor..	Ala..	Han..	AC..	DL.....	Old..	D...	Del..	P.Own..	Own.	Nb-Mec.	1/2 Own..	BH..
12	Cadillac.....V16-90	7250	154	7.50/17	16-3x4	57.5	452.0	185-3800	6.00	43.7	CI..	Mor..	Ala..	Cu...	AC..	DL....	Own.	D...	D....	dp.Own..	Own.	Nb-Mec.	3/4 Own..	KP..
13	Chevrolet..Mas. Con.	640	113	5.50/17	6-3 1/16x4	26.3	206.8	79-3200	6.00	35.2	CI..	Gear.	CI...	No...	AC..	Car....	Own.	D...	D....	P.Own..	Own.	m-Own..	1/2 Own..	OH..
14	Chevrolet....Master	....	113	5.50/17	6-3 1/16x4	26.3	206.8	79-3200	6.00	34.6	CI..	Gear.	CI...	No...	AC..	Car....	Own.	D...	D....	P.Own..	Own.	m-Own..	1/2 Own..	OH..
15	Chevrolet.....Std.	535	109	5.25/17	6-3 1/16x4	26.3	206.8	79-3200	6.00	39.5	CL..	Gear.	CL...	No...	AC..	Car....	Own.	D...	D....	P.Own..	Own.	m-Own..	1/2 Own..	OH..
16	Chrysler.....Six	875	118	6.25/16	6-3 5/16x4 1/2	27.3	241.5	93-3400	6.00	41.5	CI°.	Ch...	Al...	Pur..	Bur..	Car....	NS..	A...	Wil..	P.B&B..	Own.	Nb-UP..	1/2 Own..	LH..
17	Chrysler.. DeLuxe 8	1045	121	6.50/16	8-3 1/4x4 1/8	33.8	273.8	105-3400	6.20	43.3	CI°.	Ch...	Al...	Pur..	AC..	Str.....	NS..	A...	Wil..	P.B&B..	Own.	Nb-UP..	1/2 Own..	LH..
18	Chrysler....Airflow 8	1345	123	7.00/16	8-3 1/4x4 1/8	33.8	323.5	115-3400	6.20	41.8	CI°.	Ch...	Al...	Pur..	AC..	Str.....	Bur..	A...	Wil..	P.B&B..	Own.	Nb-UP..	1/2 Own..	LH..
19	Chrysler..Air. Imp. 8	1475	128	7.50/16	8-3 1/4x4 1/8	33.8	323.5	130-3400	6.50	42.4	Al..	Ch...	Al...	Pur..	AC..	Str.....	Bur..	A...	Wil..	P.B&B..	Otwg.	Nb-UP..	1/2 Own..	LH..
20	Chrysler..Af.Cus.Im.8	....	137	7.50/16	8-3 1/4x4 1/8	33.8	323.5	130-3600	6.50	....	Al..	Ch...	Ala..	Pur..	AC..	Str....	Bur..	A...	Wil..	P.B&B..	Otwg.	Nb-UP..	1/2 Own..	LH..
21	Cord.....810	1095	125	6.50/16	8-3 1/2x3 3/4	39.2	288.6	125-3500	6.50	....	Al..	Whit.	Al...	No...	AC..	Str....	Buf..	A...	USL.	P.Long..	Own.	.....	Tu Own.	LH..
22	De Soto..Airstream 6	810	118	6.25/16	6-3 5/16x4 1/2	27.3	241.5	93-3400	6.00	(e)	CI°.	Ch...	Ala..	Pur..	Bur..	Car....	NS..	A...	Wil..	P.B&B..	WG..	Nb-UP..	1/2 Own..	LH..
23	De Soto....Airflow 6	1095	115 1/2	6.50/16	6-3 5/16x4 1/2	27.3	241.5	100-3400	6.50	35.6	Al..	Ch...	Ala..	Pur..	AC..	Car....	NS..	A...	Wil..	P.B&B..	Own.	Nb-UP..	1/2 Own..	LH..
24	Dodge.....Six	695	116	6.00/16	6-3 1/4x4 3/8	25.3	217.8	87-3600	6.50	40.0	CI..	Ch...	Ala..	Pur..	AC..	Str....	NS..	A...	Wil..	P.B&B..	Own.	Nb-UP..	1/2 Own..	LH..
25	Duesenberg.....J	.....	142-153 1/2	7.00/19°	8-3 3/4x4 3/4	45.0	419.7	320-4200	5.20	....	CI..	LB...	Al...	Pur..	Y.....	Str.....	.....	D...	Exi..	dp.Long.	Own.	m-Spi...	1/2 Own..	PH..
26	Ford.....V8	520	112	6.00/16	8-3 1/16x3 3/4	30.0	221.0	85-3800	6.30	41.2	Al..	Gear	Al...	Yes..	Yes	Str.....	Own.	O...	Own.	P.Os....	Own.	m-Own..	3/4 Own..	OM..
27	Graham.....6-80	635	111	6.00/16	6-3x4	21.6	169.6	70-3500	6.80	37.1	Al..	LB...	Als..	No...	AC..	Mar...	Old..	D...	Wil..	P.Ill....	WG..	Nb-Spi..	1/2 Spi...	OH..
28	Graham.....6-80A	595	111	5.25/17	6-3x4	21.6	169.6	70-3500	6.80	....	Al..	LB...	Als..	No...	AC..	Mar...	Old..	D...	Wil..	P.Ill....	WG..	Nb-Spi..	1/2 Spi...	OH..
29	Graham.....6-90	765	115	6.00/16	6-3 1/4x4 3/8	25.3	217.8	85-3300	6.70	39.7	Al..	LB...	Als..	No...	AC..	Mar...	Old..	D...	Wil..	P.Ill....	WG..	Nb-Spi..	1/2 Spi...	OH..
30	Graham.....6-90A	695	115	6.00/16	6-3 1/4x4	25.3	199.1	80-3300	6.70	44.2	Al..	LB...	Als..	No...	AC..	Mar...	Old..	D...	Wil..	P.Ill....	WG..	Nb-Spi..	1/2 Spi...	OH..
31	Graham S. C 6, 110	865	115	6.25/16	6-3 1/4x4 3/8	25.3	217.8	112-4000	6.70	....	Al..	LB...	Als..	Fram	AC..	Mar(e).	Old..	D...	Wil..	P.Ill....	WG..	Nb-Spi..	1/2 Spi...	OH..
32	Hudson.....6-63	785	120	6.00/16	6-3x5	21.6	212.0	93-3800	6.25	39.3	CI.°	Ge°.	Al...	No...	AC..	Car....	Old..	A...	Nat..	P.Own†.	Own.	Nb-Spi..	1/2 Own..	BH..
33	Hudson..8, 64-S-6-7	830	120-127	6.25/16	8-3x4 1/2	28.8	254.0	113-3800	6.00	(d)	CI.°	Ge°.	Al...	No...	AC..	Car....	Old..	A...	Nat..	P.Own†.	Own.	Nb-Spi..	1/2 Own..	BH..
34	Hupmobile....618-G	815	118	6.00/16	6-3 1/2x4 1/2	29.4	245.3	101-3600	5.75	45.4	CI..	Mor..	Als..	No...	Bur..	Car....	Old..	A...	Wil..	P.B&B..	WG..	Nb-Spi..	1/2 Spi...	LH..
35	Hupmobile....621-N	995	121	6.50/16	8-3 5/16x4 3/4	32.5	303.2	120-3500	5.80	47.3	CI..	Mor..	Als..	No...	Bur..	Car....	Old..	A...	Wil..	P.Long..	WG..	Nb-UP..	1/2 Spi...	LH..
36	Lafayette.....3610	675	113	6.00/16	6-3 1/4x4 3/8	25.3	217.7	83-3200	5.61	39.4	CI..	Whit.	Als..	No...	AC..	Str.....	.....	A...	USL.	P.B&B..	Own.	Nb-.....	1/2 Spi...	BH..
37	La Salle.....36-50	1185	120	7.00/16	8-3x4 3/8	28.8	248.0	105-3600	6.25	39.0	CI..	Whit.	Al...	No...	AC..	Str.....	Old..	D...	Del..	P.B&B..	Own.	Nb-Mec.	1/2 Own..	BH..
38	Lincoln.....Zephyr	1275	122	7.00/16	12-2 3/4x3 3/4	36.3	267.3	110-3900	6.7	42.5	Al..	Gear.	St.....	.....	Yes..	Str.....	Own.	O...	Own.	P.Os....	Own.	m-Own..	3/4 Own..	MO..
39	Lincoln.....V12	.....	136-145	7.50/17	12-3 1/2x4 1/2	46.8	414.0	150-3400	6.38	41.5	Ala.	Ch...	Ala..	Pur..	Yes..	Str.....	Own.	A...	Exi..	P.Long..	Own.	.....	FF Tim..	M...
40	Nash....Ambassador	885	125	6.25/16	6-3 5/16x4 3/8	27.3	234.8	93-3400	5.70	36.8	CI..	Whit.	Als..	Own.	AC..	Str.....	.....	A...	USL.	P.B&B..	Own.	Nb-Mec.	1/2 Own..	BH..
41	Nash..Amb. Super 8	995	125	6.50/16	8-3 1/16x4 1/4	31.2	260.8	102-3400	5.25	36.5	CI..	Ch...	Als..	Own.	AC..	Str.....	.....	A...	USL.	P.B&B..	Own.	Nb-Mec.	1/2 Own..	BH..
42	Nash.....400	740	117	6.00/16	6-3 5/16x4 3/8	27.3	234.8	90-3400	5.61	42.2	CI..	Whit.	Als..	.....	AC..	Str.....	.....	A...	USL.	P.B&B..	Own.	Nb-.....	1/2 Own..	BH..
43	Oldsmobile.....F36	795	115	6.50/16	6-3 1/16x4 1/8	26.3	213.3	90-3400	6.00	39.2	CI..	Whit.	Ala..	No...	AC..	Car....	Hay..	D...	D....	P.B&B..	Own.	Nb-Mec.	1/2 Own..	BH..
44	Oldsmobile.....L36	910	121	7.00/16	8-3x4 1/4	28.8	240.3	100-3400	6.20	40.2	CI..	Whit.	Ala..	No...	AC..	Car....	Buf..	D...	D....	P.B&B..	Own.	Nb-Mec.	1/2 Own..	BH..
45	Packard.....36-120B	1075	120	7.00/16	8-3 1/4x4 1/4	33.8	282.0	120-3800	6.50	41.8	Al..	Mor..	Als..	.....	AC..	Str.....	.....	A...	Pre..	P.Long..	Own.	Nb-Mec.	1/2 Own.	LH..
46	Packard.....8	2385	127-34-39	7.00/17	8-3 5/8x5	32.5	320.0	130-3200	6.50	37.9	Al..	Mor..	Als..	Pur.	AC..	Str.....	.....	D‡.	Pre..	P.Long..	Own.	Nb-UP..	1/2 Own.	BP..
47	Packard.....Super 8	2990	132-39-44	7.00/17	8-3 1/2x5	39.2	384.8	150-3200	6.30	40.7	Al..	Mor..	Als..	Pur.	AC..	Str.....	.....	D‡.	Pre..	P.Long..	Own.	Nb-Spi..	1/2 Own.	BP..
48	Packard.....Twelve	3960	138-144	7.50/17	12-3 7/8x4 1/4	56.7	473.0	175-3200	6.40	44.3	Al..	Mor..	Als..	Pur.	AC..	Str.....	.....	A‡.	Pre..	P.Long†.	Own.	Nb-Spi..	1/2 Own.	BP..
49	Pierce-Arrow...1601	3195	138-144	7.00/17	8-3 1/2x5	39.2	385.0	150-3400	6.40	....	Al..	Whit.	Als..	Pur.	AC..	Str.....	Buf.	D‡.	Wil..	P.Long..	WG..	Nb-UP..	1/2 Own..	Ste..
50	Pierce-Arrow...1602	3695	138-144	7.50/17	12-3 1/2x4	58.8	462.0	185-3400	6.40	....	Al..	Whit.	Als..	Pur.	AC..	Str.....	Buf.	D‡.	Wil..	P.Long..	WG..	Nb-UP..	1/2 Own..	Ste..
51	Pierce-Arrow..1603	4795	147	7.50/17	12-3 1/2x4	58.8	462.0	185-3400	6.40	....	Al..	Whit.	Als..	Pur.	AC..	Str.....	Buf.	D‡.	Wil..	P.Long..	WG..	Nb-UP..	1/2 Own..	Ste..
52	Plymouth P1	545	113	5.25/17	6-3 1/16x4 3/8	23.4	201.3	82-3600	6.70	38.8	CI..	Ch...	Ala..	Pur.	Bur..	Car....	NS..	A...	Wil..	P.B&B..	Own.	Nb-UP..	1/2 Own.	LH..
53	Plymouth.....P2	....	113	6.00/16	6-3 1/16x4 3/8	23.4	201.3	82-3600	6.70	37.9	CI..	Ch...	Ala..	Pur.	AC..	Car....	Own.	A...	Wil..	P.B&B..	Own.	Nb-UP..	1/2 Own.	LH..
54	Pontiac...Master Six	720	112	6.00/16	6-3 5/16x3 7/8	27.4	208.0	80-3600	6.20	37.6	CHI	Mor..	CHI.	No...	A...	Car....	Own.	D...	Del..	P.Own..	Own.	m-Own..	1/2 Own.	BH..
55	Pontiac..DeLuxe Six	720	112	6.00/16	6-3 5/16x3 7/8	27.4	208.0	80-3600	6.20	36.8	CHI	Mor..	CHI.	No...	AC..	Car....	Own.	D...	Del..	P.Own..	Own.	m-Own..	1/2 Own.	BH..
56	Pontiac.....Eight	770	116 5/8	6.50/16	8-3 1/4x3 1/2	33.8	232.3	87-3800	6.20	40.0	CHI	Mor.	CHI.	No...	AC..	Car....	Own.	D...	Del..	P.Own..	Own.	m-Own..	1/2 Own.	BH..
57	Reo...Fly. Cld. 1936	795	115	6.25/16	6-3 5/16x4 1/4	27.3	228.0	90-3400	6.50	39.4	Al..	Mor..	Als..	Pur..	AC..	Car....	Old..	D...	Wil..	P.B&B..	WG..	Nb-Spi..	1/2 Spi...	LH..
58	Studebaker..Dict. 6	720	116	6.00/16	6-3 1/4x4 3/8	25.4	217.8	90-3400	6.30	42.2	CI..	Dia..	Ly..	No...	Bur..	Str.....	Bur..	A...	Wil..	P.B&B..	WG..	Nb-Spi..	1/2 Spi...	LH..
59	Studebaker.Dict. .P1	....	116	6.00/16	6-3 1/4x4 3/8	25.4	217.8	90-3400	6.30	....	CI..	Dia..	Ly..	No..	Bur..	Str.....	Bur..	A...	Wil..	P.B&B..	WG..	Nb-Spi..	1/2 Spi...	LH..
60	Studebaker...Pres. 8	1015	125	6.50/16	8-3 1/16x4 1/4	30.0	250.4	115-3600	6.50	41.6	Al..	Dia..	Ly..	Fram	Bur..	Str.....	Bur.	D...	Wil..	P.Long..	WG..	Nb-Spi..	1/2 Spi...	LH..
61	Terrap'..DeL.& Cus.6	670	115	6.00/16	6-3x5	21.6	212.0	88-3800	6.00	(e)	CI°.	Ge°..	Al...	No...	AC..	Car....	Old..	A...	Nat..	P.Own†.	Own.	Nb-Spi..	1/2 Own..	BH..
62	Willys.....77	395	100	5.00/17	4-3 1/16x4 3/8	15.6	134.2	48-3200	5.70	....	CI..	LB...	CI...	No...	Mo..	Til.....	Buf..	A...	USL.	P.B&B..	Own.	m-UP....	1/2 Own.	BM..

ABBREVIATIONS
°—Others Used
*—Generator and Starter Autolite
†—Power Clutch 1/2—Semi-Floating
3/4—Three Quarters Floating
(a)—Mod. 70—41.6; Mod. 75—42.0
Al—Aluminum Ala—Anode-processed
Als—Aluminum Alloy with Strut
(b)—Mod. 80—42.5; Mod. 85—41.5
(c)—De Luxe—42.2; Cust.—42.5
Ch—Chain
CHI.—Chrome Nickel Iron
Cl—Cast Iron
(d)—De Luxe—44.2; Cust.—43.7
dp—Double Plate
(e)—De Luxe—40.7; Cust.—40.2
F—Fabric FF—Full Floating
m—Metal Ly—Lynite
N—No or None
Nb—Needle Bearing
Os-Own—Semi-centrifugal
OT—Overdrive Transmission
P—(Clutch) Single Plate
s—Super Charged Tu—Tubular

ABBREVIATIONS (Make of Units)
‡—Owen-Dyneto for Generator and Starter
††—Displacement factor computed on basis of displacement, gear ratio, effective tire diameter and weight with normal load.
A—Autolite AC—AC Spark Plug
B&B—Borg and Beck
B&B—Ball and Ball (Carter)
BH—Bendix Hydraulic Operated
BM—Bendix Mechanical (Brakes)
BP—Bendix Power Operated (Brakes)
Buf—Buffalo Pressed Steel
Bur—Burgess Car—Carter
Ch—Champion Col—Columbia
Cu—Cuno D—Delco-Remy
Del—Delco Det—Detroit
Dia—Diamond
DL—Detroit Lubricator Co.
Exi—Exide
Fle—Fleming
G—Gemmer (Steering)
Glo—Globe
Han—Handy
Hay—Hayes-Ind.
HM—Hydraulic Mechanics
Ill—Illinois L—Lavine
LB—Link Belt
LH—Lockheed Hydraulic (Brakes)

# of American Passenger Cars

Car Manufacturers and Supersede All Others Previously Published

Steering Gear Make	Compression Pressure at Cranking Speed (Lbs.)	Spark Plug: Make and Type	RINGS: No. and Width Comp.	RINGS: No. and Width Oil	Piston Pin Diameter	Piston Pin Locked in	VALVES: Head Diameter and Seat Angle: Inlet (Ins.)	Inlet Seat Angle (Degrees)	Exhaust (Ins.)	Exhaust Seat Angle (Degrees)	Stem Diameter (Ins.)	Operating Tappet Clearance: Inlet	Exhaust	Inlet Tappet Clearance for Valve Timing	Intake Valve Opens Before or After T.C.: No. of Degrees	No. of Flywheel Teeth	No. Teeth on Flywheel	IGNITION: Breaker Points Gap (Ins.)	Spark Plug Gap (Ins.)	Timing: Spark Occurs °TC	No. of Flyw. Teeth Spark Occurs TC	Breaker Housing	Rods Removed From	Crankpin Diameter (Ins.)	Crankpin Length (Ins.)	Capacity Crankcase (Qts.)	Capacity Cooling System (Qts.)	FRONT AXLE: Caster (Degrees)	Camber (Degrees)	Toe-in (Inches)	King Pin Inclination (Degrees)	Line Number
R..	....	Ch-J6	2-1/8	1-1/16 1-5/16	7/8	R.	1 5/16	30	1 11/16	45	.342	010H	.010H	.012	7 1/32B.	2 1/4B.	110	.018	.025	3B..	1B..	Au	B.	2 1/16	1 1/4	6	16	3 1/32-4	1.5	1/16	7 1/2	1
R..	....	Ch-J6	2-1/8	1-1/8 1-5/16	7/8	R.	1 5/16	30	1 1/2	45	.342	010H	.010H	.012	7 1/32B.	2 1/4B.	110	.018	.025	3B..	1B..	Au	B.	2 1/16	1 1/4	8	20	2-3	1.5	1/16	7 1/2	2
R..	....	Ch-J9B	2-1/8	1-1/8 1-5/16	7/8	R.	1 5/16	30	1 1/2	45	.342	010H	.010H	.012	7 1/32B.	2 1/4B.	110	.013	.025	3B..	1B..	Au	B.	2 1/16	1 1/4	8	20	2-3	1.5	1/16	7 1/2	3
O..	....	Cb-C7	2-1/32	1-1/16	1/2	R.	11/32	30	11/32	30	5/32	003H	.004H	....	TC..	TC..	80	.020	.020	.....	.....	Re	..	1 1/16	1 1/4	4	6	5	1 1/4	1/16-1/32	1 1/2	4
S..	....	AC-H9	2-1/16	2-1/32	5/16	R..	1 17/32	45	1 13/32	45	.371	.015	.015	.019	8B..	3 1/4B.	146	.015	.025	2B..	3/4B..	1/4 A	A.	2	1 3/4	6	13 1/4	3-3 1/2	-1/4+1/4	1/16-1/8	4	5
S..	....	AC-H9	2-1/16	2-1/32	7/8	R..	1 15/32	45	1 7/16	45	.371	.015	.015	.019	14B..	6B..	156	.015	.025	10B.	4 1/2B.	1/4 A	A.	2 1/4	1 5/8	8	17	1 3/4-2 1/4	-1/4+1/4	1/16-1/8	5	6
S..	....	AC-H9	2-1/8	2-1/32	7/8	R..	1 15/32	45	1 7/16	45	.371	.015	.015	.019	14B..	6B..	156	.015	.025	10B.	4 1/2B.	1/4 A	A.	2 1/4	1 5/8	8	17	1 3/4-2 1/4	-1/4+1/4	1/16-1/8	5	7
S..	....	AC-H9	2-1/8	2-1/32	7/8	R..	1 15/32	45	1 7/16	45	.371	.015	.015	.019	14B..	6B..	156	.015	.025	10B.	4 1/2B.	1/4 A	A.	2 1/4	1 5/8	8	17	3/4-1 1/4	-1/4+1/4	1/16-1/8	5	8
S..	....	AC-K9	2-1/16	2-1/32	7/8	F	1.87	45	1.62	45	.341	AA....	AA...	0	TC..	TC..	156	.015	.026	5B..	.....	Ad	A.	2.46	2 3/32	7	30	1 1/2-2	1/4-1	0-1/8	4°5′	9
S..	....	AC-K9	2-1/16	2-1/32	7/8	F.	1.87	45	1.62	45	.341	AA....	AA...	0	TC..	TC..	156	.015	.026	5B..	.....	Ad	A.	2.46	2 3/32	7	29	3/4-1 1/4	0-1/2	0-1/8	5°38′	10
S..	....	AC-G6	3-3/32	1-1/32	7/8	P.	1.51	45	1.39	45	11/32	AA....	AA...	0	TC..	TC..	113	.021	.026	4B..	1 1/4B.	Ad	B.	2 1/16	1 1/8	9	19	3/4-1 1/4	0-1/2	0-1/8	5°38′	11
S..	....	AC-G6	3-3/32	1-1/32	7/8	P..	1.51	45	1.39	45	11/32	AA....	AA...	0	TC..	TC..	113	.016	.026	4B..	1 1/4B.	Ad	B.	2 1/16	2 1/4	10	24	1 1/2	1	1/16-3/16	4	12
O..	112	AC-K11	2-1/16	1-3/16	.99	R..	1 11/32	30	1 13/32	30	11/32	.006H	.013H	.006	9B..	3 1/4B.	133	.021	.032	5B..	1 3/4B.	Ad	A.	2 1/16	1 3/32	5	15	2 3/4±1/2	1±1/2	1/4-1/16	‡	13
O..	112	AC-K11	2-1/16	1-3/16	.99	R..	1 11/32	30	1 13/32	30	11/32	.006H	.013H	.006	9B..	3 1/4B.	133	.021	.032	5B..	1 3/4B.	Ad	A.	2 1/16	1 3/32	5	15	0	1/4	2/16-1/16	7 3/4	14
O..	112	AC-K11	2-1/16	1-3/16	.99	R..	1 11/32	30	1 13/32	30	11/32	.006H	.013H	.006	9B..	3 1/4B.	133	.021	.032	5B..	1 3/4B.	Ad	A.	2 1/16	1 3/32	5	15	.....	1±1/2	2/16-1/16	‡	15
G..	....	AC-K9	2-1/16	2-1/32	11/32	F..	1 17/32	45	1 15/32	45	.340	.006H	.008H	.010	TC..	TC..	146	.020	.025	TC..	TC..	Au	A.	2 1/16	1 1/16	6	19	1 1/2	†	0-1/16	9 1/4	16
G..	....	AC-K9	2-1/16	2-1/32	11/32	F..	1 17/32	45	1 15/32	45	.340	.006H	.008H	.011	2B..	3/4B.	146	.018	.025	TC..	TC..	Au	A.	2 1/16	1 1/16	6	22	1 1/2	†	0-1/16	5 1/4	17
G..	....	AC-K9	2-1/16	2-1/32	11/32	F..	1 17/32	45	1 15/32	45	.340	.006H	.008H	.011	2B..	3/4B.	146	.018	.025	TC..	TC..	Au	A.	2 1/16	1 1/16	6	....	2	††	0-1/16	5	18
G..	....	AC-KL9	2-1/16	2-1/32	11/32	F..	1 17/32	45	1 11/32	45	.3.6	H .008	H .011	2B..	3/4B.	.146	146	.018	.025	5A..	2A..	Au	A.	2 1/16	1 1/16	6	....	2	††	0-1/16	5	19
G	....	AC-KL9	2-1/16	2-1/32	11/32	F..	1 17/32	45	1 11/32	45	.340	.006H	.008H	.011	2B..	3/4B.	146	.018	.025	5A..	2A..	Au	A.	2 1/16	1 1/16	6	17	2	††	0-1/16	5	20
G..	....	Ch-J9B	2-1/32	1-1/16 1-3/16	7/8	F..	1 15/32	30	1 17/32	45	.342	.010H	.010H	.012	7 1/32B.	.....	.....	.....	.018	.025	3B.	.....	Au	.....	.....	.....	.....	.....	.....	.....	.....	.....	21
G..	....	AC-K9	2-1/16	2-1/32	11/32	F..	1 17/32	45	1 15/32	45	.340	.006H	.008H	.010	TC..	TC..	146	.020	.025	TC..	TC..	Au	A.	2 1/16	1 1/16	6	19	1 1/2	†	0-1/16	9 1/4	22
G..	....	AC-K9	2-1/4	2-1/32	11/32	F..	1 17/32	45	1 13/32	45	.340	.006H	.008H	.010	TC..	TC..	146	.020	.025	5A..	2A..	Au	A.	2 3/16	1 1/16	6	19	2	††	0-1/16	8	23
G..	....	AC-K9	2-1/4	2-1/32	11/32	F..	1 1/2	45	1 13/32	45	.340	.006H	.008H	.011	6A..	2 1/2A.	146	.020	.025	4A..	1 3/4A.	Au	A.	2 1/16	1	5	15	2	††	0-1/16	9 1/4	24
R..	....	.....	3-1/16	1-5/16	1 1/16	F..	1 1/2	30	1 1/16	30	11/32	.015C	.015C	.025	6B..	2B..	119	.021	.025	1 1/2"B*	.....	Ad	..	2 7/16	1 3/4	12	32	3	1	1/4	....	25
O..	105	Ch-C7	2-1/32	1-1/32	3/4	F.	1 11/32	45	1 11/32	45	5/16	.013C	.013C	....	9 1/2B.	3B..	112	.013	.025	4B..	1 1/4B.	Au	A.	2	1 5/16	5	22	7	3/4	1/16-1/8	8 1/4	26
R..	....	Ch-C7	2-1/16	2-3/32	3/8	R.	1 23/32	30	1 11/16	45	5/16	.010H	.010H	.012	4 1/2B.	1 1/2B.	130	.018	.025	2B..	3/4B..	Au	A.	1 11/16	1 11/16	5	11	2 1/2	1	1/16	7 1/2	27
R..	....	Ch-C7	2-1/8	....	1/16	R..	1 23/32	30	1 11/16	45	1/16	.010H	.010H	.012	4 1/2B.	1 1/2B.	130	.018	.025	2B..	3/4B..	Au	A.	1 11/16	1 11/16	5	11	2 1/2	1	1/16	7 1/2	28
R..	....	Ch-14MM	2-1/16	2-3/32	3/8	R..	1 23/32	30	1 11/16	45	5/16	.010H	.010H	.012	4 1/2B.	1 1/2B.	130	.018	.025	2B..	3/4B..	Au	A.	1 11/16	1 11/16	5	15	2 1/2	1	1/16	7 1/2	29
R..	....	Ch-14MM	2-1/16	2-3/32	11/32	R..	1 23/32	30	1 11/16	45	1/16	.010H	.010H	.012	2A..	....	130	.018	.025	TC..	.....	Au	A.	1 11/16	1 11/16	5	15	2 1/2	1	1/16	7 1/2	30
R..	....	Ch-14MM	2-1/16	2-3/32	11/32	R..	1 23/32	30	1 11/16	45	1/16	.010H	.010H	.012	4 1/2B.	1 1/2B.	130	.018	.025	2B..	3/4B..	Au	A.	1 11/16	1 11/16	5	15	2 1/2	1	1/16	7 1/2	31
G..	....	Ch-J8	2-3/32	2-3/16	3/4	F.	1 3/4	45	1 5/16	45	3/16	.006H	.008H	.010	10 3/32B.	4B..	134	.020	.022	TC.	TC..	Au	A.	1 5/16	1 3/16	5	13	3 1/2-4 1/2	1-1 1/2	0-1/16	7	32
G..	....	Ch-J8	2-1/32	2-3/16	3/4	F..	1 1/2	45	1 5/16	45	3/16	.006H	.008H	.010	10 3/32B.	4B..	134	.020	.022	TC.	TC..	Au	a	1 5/16	1 3/16	7	23	3 1/2-4 1/2	1-1 1/2	0-1/8	7	33
R..	107	Ch-C7A	2-1/16	2-1/32	7/8	F.	1 11/32	45	1 11/32	45	.340	.010	.013	.014	2B..	1/2B..	112	.018	.028	7B..	2 1/4B.	Ad	A.	2 1/16	1 1/4	6	18	1 1/2	1	1/16-3/16	7 1/2	34
G..	113	Ch-C7A	2-1/16	2-1/32	7/8	F..	1 11/32	45	1 11/32	45	.340	.006	.013	.010	1A....	1/4A..	109	.016	.028	7B..	2 1/4B.	Ad	B.	2 3/16	1 1/4	8	21 1/2	1 1/2	1 1/4	1/16-3/16	8 1/2	35
G..	100	Ch-C15	2-1/16	2-	7/8	F..	1 13/32	45	1 11/32	45	....	.015	.015	.015	.....	.....	104	.020	.023	10B.	3B..	Au	A.	2	1 13/32	7	19	2 3/32	1 1/32	1/16	7	36
S..	....	AC-K9	2-1/16	1-1/16 1-5/32	11/32	P..	1 3/16	30	1 13/32	45	11/32	.006C	.009C	.015	6A....	2 1/16A.	145	.015	.025	8B..	3 1/4B.	Au	B.	2 1/4	1 7/16	7	16 1/2	2	1/16	1/16	4 1/16	37
O..	105	Ch-J9	2-3/16	1-5/16	.....	.....	1.54	45	1.54	45	.311	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2 1/16	....	6	27	7	3/4	1/16-1/16	8 1/4	38
O..	105	Ch-7	2-1/16	2-1/32	7/8	P..	1 5/16	45	1 5/16	45	5/16	.004C	.006C	.004	21B..	6 3/4B.	116	.020	.022	7B..	2 1/4B.	Au	B.	2 1/32	1	12	32	1 1/2	1	1/16-1/16	7 1/2	39
G..	100	AC-K12	2-1/16	1-1/8 1-5/16	7/8	F..	1 3/4	45	1 11/32	45	.372	.015H	.015H	.015	.....	.....	.....	.020	.025	.....	.....	.....	A.	2	1 7/16	7	17 1/2	2 1/2	1 1/2	1/8	7	40
G..	90	AC-K12	2-1/16	1-1/8 1-5/16	7/8	F..	1 31/32	45	1 11/32	45	.372	.015H	.015H	.015	.....	.....	.....	.020	.025	15B.	.....	.....	B.	2	1 7/64	8	21	2 1/2	1 1/2	1/8	7	41
G..	100	AC-G8	2-1/16	1-1/8 1-5/16	7/8	F..	1 31/32	45	1 11/32	45	.341	.015	.015	.015	5A....	1 1/2A.	104	.020	.025	10B.	3B..	Au	A.	2	1 11/32	7	18	2 1/2	1 1/2	1/8	7	42
S..	....	AC-G9	2-1/16	2-3/32	11/32	P..	1 5/16	30	1 21/64	45	11/32	.008H	.010H	....	5B..	2B..	145	.020	.033	TC..	TC..	Au	A.	2	1 3/16	6	13	1 1/2-2 1/4	1/16-1	1/16-3/16	5°51′	43
S..	....	AC-G9	2-1/16	2-3/32	11/32	P..	1 5/16	30	1 21/64	45	11/32	.008H	.010H	....	TC..	TC..	145	.015	.033	2B..	3/4B..	Au	B.	2 1/4	1 3/16	7	16	1 1/2-2 1/4	1/16-1	1/16-3/16	5°51′	44
O..	110	AC K-7 or Ch J-8	2-1/16	1-3/16	7/16	F.	1 17/32	30	1 13/32	45	11/32	.007H	.010H	....	7B..	.....	140	.020	.029	7B..	2B..	Au	A.	2 1/32	1 3/16	7	18	2	1	1/16-1/16	1 1/2	45
G..	110		3-1/16	1-1/32	7/16	F.	1 17/32	45	1 13/32	45	.340	.004H	.006H	.004	30B..	9 3/4B.	118	.020	.029	6B..	2B..	Au	B.	2 3/16	1 1/32	8	20	1	1	0-1/16	9	46
G..	110		3-1/16	1-1/32	7/16	F.	1 15/16	45	1 13/16	45	.340	.004H	.006H	.004	30B..	9 3/4B.	118	.020	.029	6B..	2B..	Au	B.	2 3/16	1 1/4	9	22	1	1	0-1/16	9	47
G..	110		3-1/16	1-1/32	7/16	F.	1 17/32	45	1 13/32	45	.340	AA....	AA...	.004	TC..	TC..	118	.020	.029	8B..	2 1/2B.	Au	B.	2 1/16	2 1/4	10	40	1	1	0-1/16	9	48
R..	80	Ch-U6	3-1/16	1-3/32	7/16	F.	1 13/32	45	1 7/16	45	372	AA....	AA...	.010	5A....	1 1/2A.	116	.018	.025	2B..	1/2B..	Ad	A.	2 1/16	1 1/4	9	25	3/4	1	1/16	8	49
R..	85	AC-14MM	3-1/16	1-3/32	7/16	F.	1 17/32	45	1 7/16	45	.372	AA....	AA...	.004	19B..	6B..	116	.018	.025	5B..	1 1/2B.	Ad	A.	2 1/16	1 11/16	11	38	3/4	1	1/16	8	50
R..	85	AC-14MM	3-1/16	1-3/32	7/16	F.	1 13/32	45	1 7/16	45	.372	AA....	AA...	.004	19B..	6B..	116	.018	.025	5B..	1 1/2B.	Ad	A.	2 1/16	1 1/16	11	38	3/4	1	1/16	8	51
G..	....	AC-K9	2-1/16	2-1/32	11/32	F..	1 15/32	45	1 13/32	45	.340	.006H	.008H	.011	6A....	2 1/2A.	146	.020	.025	4A..	1 1/4A.	Au	A.	1 15/16	1	5	15	1-3	1/4-3/4	0-1/16	9 1/2	52
G..	....	AC-K9	2-1/8	2-1/32	11/32	F..	1 17/32	45	1 13/32	45	.340	.006H	.008H	.011	6A....	2 1/2A.	146	.020	.025	4A..	1 1/4A.	Au	A.	1 15/16	1	5	15	1-3	1/4-3/4	0-1/16	9 1/2	53
O..	....	AC-K7	2-1/16	1-3/16	5/16	P.	1 17/32	30	1 13/32	45	.310	.010H	.010H	.010	5B....	2B..	139	.020	.025	4B..	1 1/2B.	Au	A.	2	1 7/16	6	15	1-1 1/2	1 1/4-1 3/4	0-1/16	7 1/2	54
O..	....	AC-K7	2-1/16	1-3/16	5/16	P.	1 17/32	30	1 13/32	45	.310	.010H	.010H	.010	5B....	2B..	139	.020	.025	4B..	1 1/2B.	Au	A.	2	1 7/16	6	15	0	0-1/4	0	8 3/4	55
O..	....	AC-K7	2-1/16	1-3/16	5/16	P.	1 11/32	30	1 13/32	45	.310	.010H	.010H	.010	5B....	2B..	139	.018	.025	4B..	1 1/2B.	Au	A.	2	1 5/16	7	16 3/4	0	0-1/4	0	8 3/4	56
R..	85	Ch-C7A	3-1/32	1-1/32 1-5/32	11/32	F..	1 15/16	45	1 15/16	45	11/32	.007H	.008H	.012	5B....	2B..	150	.020	.025	2B..	3/4B..	Au	5/8	2 5/16	1 3/16	6	18	1 1/2	1 1/16	1/16	8	57
R..	105	Ch-S8	2-1/16	1-5/16	7/16	R.	1 13/32	45	1 1/32	45	11/32	.016C	.016C	.020	15B..	5 1/2B.	130	.020	.025	2B..	3/4B..	Au	A.	2 5/16	1 3/16	6	14	1-1 1/16	1-1 1/16	1/16-1/16	9 1/2	58
R..	105	Ch-S8	2-1/8	1-5/16	7/8	R.	1 13/32	45	1 1/32	45	11/32	.016C	.016C	.020	15B..	5 1/2B.	130	.020	.025	2B..	3/4B..	Au	A.	2 5/16	1 3/16	6	14	(a)	1-1 1/2	1/16-1/16	9 1/2	59
R..	105	Ch-S8	2-1/8	1-1/16	7/8	R.	1 11/32	45	1 1/32	45	11/32	.016C	.016C	.020	15B..	5 1/2B.	133	.020	.025	TC..	TC..	Au	A.	1 7/8	1 5/16	8	17.6	(a)	1-1 1/2	1/16-1/16	9 1/2	60
G.	....	Ch-J8	2-3/32	2-3/16	3/4	F..	1 5/16	45	1 5/16	45	3/16	.006H	.008H	.010	10 3/32B.	4B..	134	.020	.022	TC..	TC..	Au	A.	1 5/16	1 3/16	6	13	3 1/2-4 1/2	1-1 1/2	0-1/16	7	61
L..	....	Ch-C7	3-1/32	1-1/16	7/8	F..	1 11/32	45	1 11/32	45	.371	.004H	.006H	.010	TC....	TC..	96	.018	.025	5A..	.....	Au	A.	1 5/16	1 1/16	4	9	1-2	2	1/32	7 1/2	62

M—Midland Steeldraulic
m—Midland
Mar—Marvel
Mo—Monroe
Mor—Morse
Mun—Muncie
Nat—National
N—Northeast (Ignition)
Nb—Needle Bearing
NS—Noblitt Sparks
O—Own
OH—Own Hydraulic
OM—Own Mechanical
Old—Oldberg

Pre—Prest-O-Lite
Pur—Purolator
R—Ross
Rock—Rockford
S—Saginaw
Sal—Salisbury
Spi—Spicer
Spir—Spiral Gear
Ste—Stewart-Warner
Str—Stromberg
Til—Tillotson
Tim—Timken

UP—Universal Products
Wal—Walker
WG—Wagner Gear Co.
Whit—Whitney
Wil—Willard
Zen—Zenith

ABBREVIATIONS
‡ Rods below—Pistons above
†—(—1/4 to+3/4)
††—(3/4±1/4)
—7 1/16±1
(a)—(—1/4 to+3/4)
*—Measured on rim of flywheel
A—After
A—Above (Rod removal)
(a)—Above or below
AA—Automatic Adjuster
Ad—Advanced
Au—Automatic
B—(Valve and Ignition timing)—Before
B—Below (Rod removal)
C—Cold (Tappet clearance)

F—Flat
F—(Pin locked in) Floating
H—Hot
L—Link
Ma—Manual
N—None
P—(Pin locked in) Piston
R—(Pin locked in) Rod
Re—Retarded
RZ—Rzeppa (Gear Grinding Machine Co.)
S—Slide
s—Sectors
TC—Top Center

Mobile

THE remarkable progress accomplished by the German automotive industry during the past three years can be attributed in large part to the constructive measures taken by the German government.

Much has been written about the more spectacular features of Germany's motorization campaign—suppression of luxury taxes, promotion of economical, low-priced cars, attempts to find "ersatz" (substitute) fuels and synthetic rubber to make the nation independent of imports.

Less pretentious, but of greater real value, perhaps, to the industry have been other phases of the German program. A great system of express highways has been planned to link all the important cities of the Reich, and long stretches of these have already been

1. Students in the automobile school at Arnstadt are examined on what they have learned about automobile chassis.

European, Keystone and *Deutsche Kraftfahrt* photos.

2. A highway traffic police officer instructs children in a village school on the meaning of traffic signs and signals.

3. The traffic police stop a truck to check up on its mechanical condition and inspect the tires.

4. Highway traffic police on inspection with municipal police officials (dark uniforms) whom they have been detailed to instruct in the fine points of traffic regulation.

Germany—

A comprehensive plan for development of motor vehicles and highways is accompanied by mass motor education in Hitler's Reich

completed with work advancing rapidly on the remainder. These new roads are of the most modern design, having two one-way lanes separated by shrubbery. The roads are built of concrete, without grade-crossings, and with "cloverleaf" intersections.

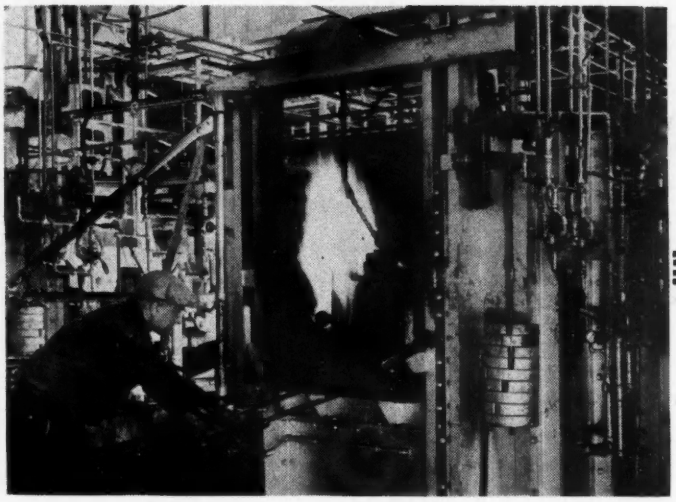
A new highway traffic police corps was created and has duties more varied than any similar organization in other countries. The members of this corps are trained in traffic control, their instruction looking ahead to the time when Germany will have a motor traffic far more intense than at present. They in turn teach the police of villages and smaller cities proper methods of handling automobile traffic. They go into schools all over the country and instruct the pupils in traffic rules and signals. The state highway traffic po-

(*Turn to page* 547 *please*)

5. Duties of highway traffic police include the inspection of horse-drawn vehicles to see that regulations concerning harness, loads, etc., are being complied with.

6. Motorists in difficulties can rely on the traffic police to help them out.

7. Spade work by Der Führer. Hitler takes the first shovel-full when work is begun on the new highway program.



PRODUCTION LINES

The latest methods and equipment for heat treating are in operation at Chevrolet's newest manufacturing plant, at Saginaw, Mich. Here is one of a battery of gas carburizing furnaces, used for hardening the surface of transmission countershafts, synchronizing drums, and other small parts.

Big Doings

For several years the seclusion of the research lab has held back the news of studies of the Dardelet Threadlock fastenings which have been under observation in many important plants. While we are not yet at liberty to disclose the names of these companies we can say something about the applications for this novel self-locking fastening, eliminating as it does, lockwashers and cotter pins with their attendant grief in the field. One of the most promising applications is for connecting rod bolts and this has given signal account of itself on many well-known engines here and abroad. Another application is on heavy duty motor trucks. The Dennis (Eng.) has used Dardelet threaded studs for wheel fastenings while a number of large fleet operators in this country have replaced the usual fastenings with Dardelet. One of the novel possibilities in heavy-duty truck design is the use of the Dardelet Rivet-Bolt in place of hot or cold headed rivets in frame fastenings.

For Overseas

We were talking with a British Diesel engine man the other day about this and that. One rather disturbing bit of information that we gleaned was that several English truck makers were able to sell their product in regions where the U. S.-made trucks have had a clear field heretofore. The reason—Diesel engines. It is a fact that U. S. trucks are highly prized in world markets but evidently the time has come when more aggressive action must be taken on the matter of Diesel power. Perhaps that's why a prominent export manager said recently that at least 4 to 5 per cent of all truck exports will be Diesel within the coming year. World markets must have Diesel power on trucks of every capacity, including the well-known commercial units rated at 1½ tons. At the moment the foreign market for Diesel power overshadows our own domestic requirements, for good and sufficient reasons.

For Racers

With our ear to the ground we hear of a possibility that an Indianapolis entry may be groomed with an engine fitted with a fuel oil burning attachment. The idea is to use the regular gasoline engine, whatever its make may be, and then add the unit for burning fuel oil. It's going to be well worth watching, if the deal goes through, because they claim that this attachment will cut fuel consumption between 15 and 25 per cent which is all to the good where there is a restriction on the amount of fuel permitted for the run.

Welded Jigs

A guide to lower tooling costs with the shielded arc is issued in bulletin form by The Lincoln Electric Co. It deals with the economy of producing jigs and fixtures of arc-welded steel construction rather than by fabrication from castings. The bulletin gives some comparative cost figures and examples of welded design which should be of practical value. Master mechanics and tool supervisors please note.

Wage Incentives

Factory executives should find much thought-provoking material in a paper entitled, "A Psychologist Looks at Wage-Incentive Methods," by Richard Stephen Uhrbrock, published by the AMA as a part of the Institute of Management Series. The author views critically the methods employed by factory time study men, expressing the opinion that much of the work is unscientific; also asserting that even among experts there is no standardization of techniques and measurements. Stop watch methods are particularly criticized as being unreliable, the author's leanings being decidedly in favor of micro-motion study since it relies upon photographic evidence which can be studied by a group of men and is a permanent record of performance. However, the most important point is that very little of the time-study work lays any emphasis upon studies of fatigue and here the author recommends the need for cooperative work between the time study man, the psychologist, and the trained physician. Through it all is woven the central theme that from time immemorial workers have been opposed to wage-incentive studies. And the psychologists feels that probably the biggest reason for this is that the worker has been left out of consideration when such studies are made. Reference is made to the shift in the automobile plants from wage-incentives to day rates or guaranteed hourly rates. We may add from our own first hand knowledge of the situation that wherever the shift has been made, it has resulted in a most gratifying condition not only from the workers' point of view but also to the management. Even the proponents of the hourly rate system have been surprised at the improvement in costs since its introduction.—J. G.

MANUFACTURING MANAGEMENT METALLURGY

From *Zwei Jahre Arbeit an der Reichsautobahn*, published by Volk und Reich Verlag, Berlin.

One of the new express highways near Hamburg

many's rapid motorization. Above all, the specialized training is turning out suitable candidates for the motorized sections of Germany's rapidly growing army.

The Horizons of Business

(*Continued from page* 541)

its earnings and adds the other third to surplus. The new tax, we are assured, is so graduated that a corporation which follows this procedure pays no higher tax than it paid before. This places A. T. & T. and the U. S. Steel Corp., Consolidated Gas and Kennecott Copper, Woolworth and Ingersol Rand in the same mold.

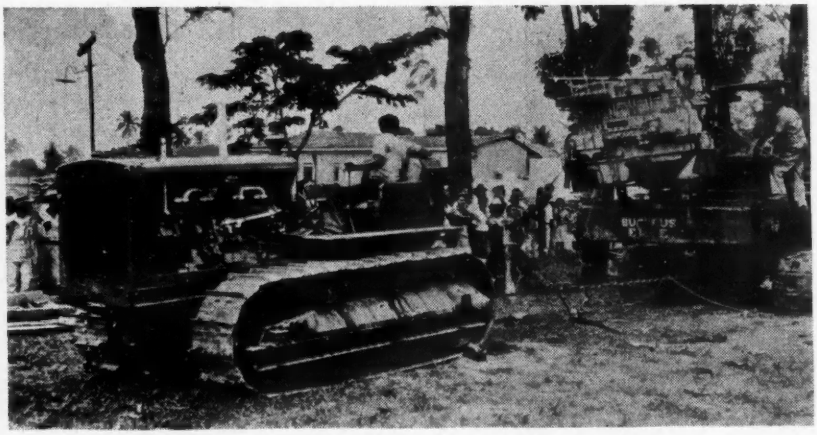
The disposition of surplus is peculiarly a function of management. The intelligence does not exist which can lay down a wise rule for more than 500,000 corporations. The tax constitutes an enervating condition of corporate life. By making corporate existence more precarious, it undermines the foundations of business stability. Incredible though it may sound somebody is actually running in two opposite directions at the same time.

Mobile Germany

(*Continued from page* 545)

lice are concerned with everything that uses the roads and enforce laws affecting horse-drawn vehicles as well as motor cars. They are under orders to cooperate with the motorist as well as to punish him, and when a driver finds himself in difficulties he can count on a passing traffic policeman for assistance.

Another important feature of the German motorization campaign is the National-Socialist Motor Corps. This organization enlists German youths and trains them in the operation and servicing of motor vehicles, particularly under difficult conditions. The training begins with motorcycles and covers all types of automotive equipment, including trucks. Young men graduating from this course are fitted to step into the many new jobs resulting from Ger-



San Salvador, capitol of the republic of El Salvador, had a fiesta the day a fleet of modern road-building machinery arrived from the U. S. The picture shows two Caterpillar Diesel tractors being used to install an engine in a Bucyrus-Erie shovel

Bauer Visiting New England To Discuss Export Problems

Foreign trade interest of New England's manufacturing concerns is being studied by George F. Bauer, manager of the export department, Automobile Manufacturers Association, who has undertaken a field trip through Massachusetts, Connecticut and Rhode Island. Mr. Bauer's schedule calls for visits to 16 of the leading industrial cities in these three States. In each of these cities, he will confer with business leaders about their foreign trade problems and operations. The purpose of his trip is to ascertain the extent to which industries in New England are dependent, directly or indirectly, upon overseas markets.

Ford Wage Dispute Charges Dismissed by Canadian Court

Twelve charges placed against the Ford Motor Co. of Canada in a minimum wage dispute were dismissed Tuesday by Magistrate D. M. Brodie in Windsor. A thirteenth charge was withdrawn Monday. The charges involved violation of the Industrial Standards Act, which is similar to the old N.R.A. legislation in this country. The Ford company claimed the act did not apply because the company had never subscribed to its provisions and therefore could not be held liable.

AAA Race Program to Open At Tampa, Fla., April 19

With Tampa, Fla., added to the automobile racing circuit of the Contest Board of the American Automobile Association, the season's opener has been moved up a week earlier than originally announced, it is revealed in a revised schedule of the sport's national governing body. Tampa presents a program of sprint races at the Plant Field Fair Ground on Sunday, April 19, thus beating by one week the previously announced inaugural at the Reading, Pa., Fair Grounds on April 26. Reading opened the 1935 season.

Other additions last week to the schedule were: Lakewood Speedway, Atlanta, Ga., May 10; Altamont, N. Y., Fair Grounds, May 30; Mineola, N. Y., Fair Grounds, July 18; Wisconsin State Fair, Milwaukee, August 23 and 26; Hughesville, Pa., August 29; Wilson, N. C., Fair, October 10; Spartanburg, S. C., Fair, October 17.

Italy Orders 20% Alcohol Blend to Cut Fuel Imports

Italy being more interested than any other European nation in limiting the importation of foreign gasoline, has issued a decree that 20 per cent of alcohol shall be mixed with all gasoline sold for automobile use.

As a further step toward the encouragement of gasoline substitutes, the annual "Thousand Miles" road race, to be run next month, will have a special class for cars running on gasoline substitutes, for which cash prizes of 160,000 liras are offered. These substitutes can be had in the nature of solids, gas or liquid. Minimum speeds varying from 30 to 36 m.p.h. have to be maintained over the thousand miles of highway, including a double crossing of the Appenine mountains.

Gasoline is now retailed in Italy at $1.20 per gal., but only limited quantities are available to ordinary users.

The Tire Industry's Sales

(Continued from page 528)

148 tons of crude rubber on hand, with 39,094 tons afloat. Much of the rubber for United States consumption has been diverted due to the Italo-Ethiopa situation and instead of coming through the Suez Canal, is coming to America across the Pacific and through the Panama Canal.

GM-Chrysler-IHC Among 15 Most Favored Stocks

General Motors, Chrysler, Standard Oil of New Jersey and, for the first time, International Harvester, appear on the list of the 15 most favored stocks, according to an analysis of the year-end portfolios of 78 investment trust companies prepared by Frazier, Jelke & Co.

General Motors, held by 57 of the companies, occupies first place for the third consecutive year and has been among the first 10 for the past five years. Chrysler, a newcomer to the list in 1933, retains third place, while Standard Oil of New Jersey is eighth and International Harvester is 12th.

Among the public utilities, American Gas and Electric alone appears on the new list, whereas in 1931 10 of the 15 were in this classification. And with the dropping of Atchison last year, Pennsylvania is the sole listing in the railroad field.

Other automotive companies, showing marked improvement in position but not attaining the selected list include Allis-Chalmers, Borg-Warner, Briggs Manufacturing, Caterpillar Tractor, Deere & Co. and Ford of Canada.

Huge Rail-Truck Tie-up Announced

(Continued from page 521)

the road to reconsider, and it is no secret that a breach has arisen between the Great Western and several other railways because of this. The nucleus of the $6,000,000 set-up is said to be the present Union Transfer Company, owned by the Union Pacific. This concern operates 65 trucks serving five states, but principally connecting Omaha and Minneapolis and Omaha and Chicago. The concern radiates from several terminals.

The Burlington Road for some time has been acquiring ownership interests in trucking companies along its entire right-of-way and has set up a separate organization for their operation.

Robert J. McBride, president of Motor Express Terminal and member of the A. T. A. committee on rates and tariffs, says: "If the railroads are to continue to buy up truck lines and follow such practices as these, the power of transportation will shortly be in the hands of a small group."

Ford Exhibit Reopened On Atlantic City Pier

The Ford Motor Co. opened a national exhibit on April 11 at the Steel Pier in Atlantic City. Last year, same spot, same space, the exhibit attracted 1,000,000 visitors. This year's show features background by Walter Dorwin Teague, music by Jose Mariana, and a Ford model service station. Show will continue through autumn and includes all Ford vehicles.